FLIGHT
and
AIRCRAFT ENGINEER

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The Outlook

The Big Shows

INCREASES in size and speed of aircraft bring problems of their own when it comes to holding exhibitions. To afford an opportunity for the greatest number of people to inspect closely the aircraft, engines and the multiplicity of auxiliary and ancillary equipment, a very large hall in the centre of a city is the obvious choice, but has the disadvantage that the exhibits must of necessity be "static." On the other hand, the R.A.F. Displays held at Hendon between the wars proved that enormous numbers are interested in dynamic demonstrations of aircraft. To combine the two is difficult because many modern aircraft are of such large dimensions that transport problems become serious, even if a hall large enough to house them can be found. The flying characteristics of many present-day aircraft are such as to require a fairly large airfield.

In this matter of exhibitions, France and Great Britain are following different courses. The S.B.A.C. Display is being held in September at Farnborough, and the general public will be admitted on two days. The rest of the time will be devoted to showing foreign visitors and potential customers what the British aircraft industry has to offer. Both are likely to be impressed.

The Paris Aero Show, to be held during the first two weeks of May next year, represents a different approach to the problem. As in previous years, the main exhibition will be held in the Grand Palais des Champs Elysées, but as its doors limit the size of exhibit that can be got into the Palais, an innovation so far as Paris Aero Shows are concerned is that aircraft, and certain airport equipment, too large for the Grand Palais, will be staged in the open on the Esplanade des Invalides. Should any aircraft not be capable of being dismantled for transport to the Invalides, it will be shown at one of the Paris airports. Exhibitors of aircraft will be able to give flying demonstrations of their aircraft types at airports in the Paris district. After the show, one or two days will be set aside for general flying demonstrations.

Each of the two plans has its merits and its drawbacks. Farnborough is well suited to the static exhibition as well as to the flying displays, and undoubtedly the foreign visitors will find the venue entirely adequate. The only drawback, so far as the general British public is concerned, is that it will have to travel a considerable distance to the show, but doubtless the Southern will organize a good train service, so the worst that can be said is that Londoners will have to incur a slightly larger expense than if the show had been held at Olympia, for example.

The French plan scores by having the two major exhibitions right in the centre of Paris, but they will be static, and if the Parisian wishes to see flying displays, he will have to go to an airfield outside the city. As a result, the emphasis is likely to be on the static part of the show in Paris whereas at Farnborough the interest should be fairly equally divided.

A Flight to Egypt

THIRTY years ago last Saturday a Handley Page biplane landed at Aboukir, near Cairo, after having been flown out from England. That was the first time in history an aircraft had accomplished this flight, and the occasion may be said to have marked the beginning of the surveys which the R.A.F. made over the England-Australia and England-South Africa Empire air routes. The Royal Air Force is still doing air surveys, but they are photographic and use the very latest equipment. The 1918 flight to Egypt, and the other R.A.F. flights which followed it, were concerned with visual inspection of the most likely routes, with the behaviour of the aircraft in less temperate climates than our own, and with locating suitable sites for airfields.

Air Vice-Marshal Borton (he was then a Brigadier-

General) and his companions, Major MacLaren and Sergeants Goldfinch and Francis, took ten days to make the trip, which lay across France, Italy, Crete, the Mediterranean and the north coast of Africa. They made numerous stops for refuelling, but on the whole the flight was uneventful, and the Handley Page O/400 and its two Rolls-Royce Eagle engines (of 375 h.p. each) behaved quite well, nursed at each stop by the two sergeants.

Nowadays, aircraft of B.O.A.C. and its associates fly the route between Great Britain and Egypt some six times a day in each direction, and next year A. V-M Borton will be able to fly three times as fast over the route which he pioneered thirty years ago, but in another Handley Page, the Hermes, scheduled for delivery at the rate of four per month, beginning next January. Should he elect to do so, he will doubtless compare the discomfort of the old O/400 with the pressurized and air-conditioned Hermes flying at 25,000ft. Not that we should like to convey the idea that A. V-M Borton has not flown since 1918. When he retired from the R.A.F. he became a director of Napiers (whose Naiad we describe in this issue) and took part in King's Cup air races, as well as doing a good deal of less strenuous flying. But on a flight such as that which we have hypothesized, A. V-M Borton's thoughts would be likely to turn back to the cold comfort of the open cockpit and the flapping fuselage fabric of the O/400.

Another Mysterious Disappearance

THERE now appears to be little hope that the Latécoère flying boat which vanished on a flight across the South Atlantic can still be afloat, and once again the aviation world, it is to be feared, is left to mourn the loss of many lives in mysterious circumstances.

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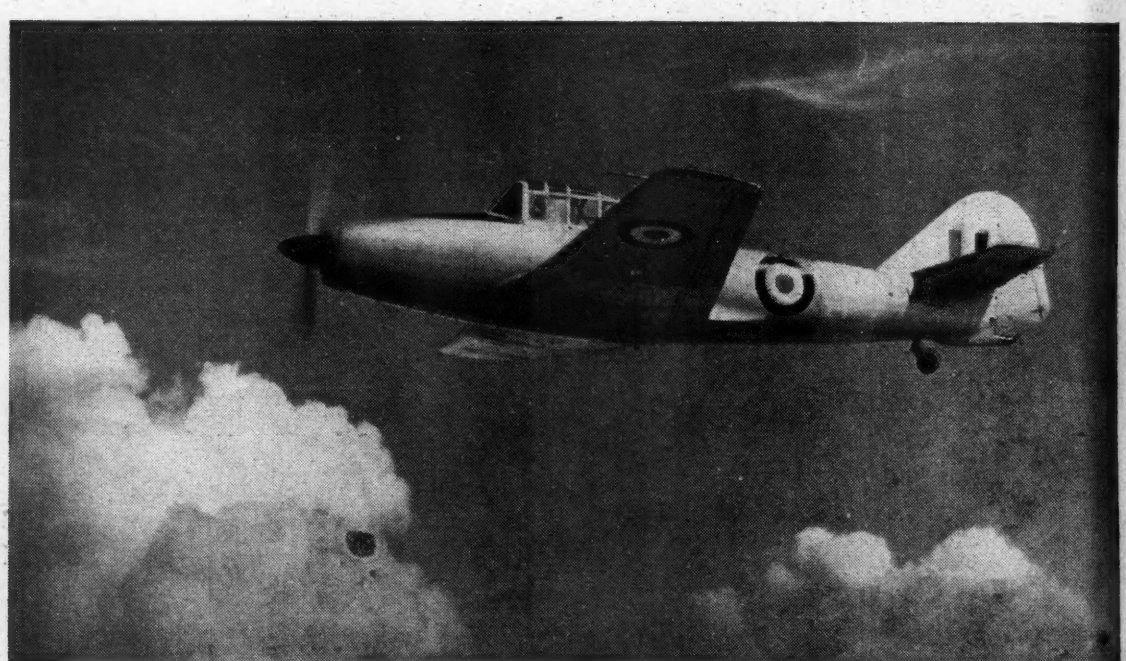
Forthcoming Events, page 193

The fact that the aircraft involved was a flying boat, and a large one at that, gave good cause for hoping that it might have made a safe descent, and that thus the passengers and crew might be rescued. In a fairly recent case a Boeing flying boat came down in the North Atlantic in a very rough sea, but in spite of this all the occupants were taken off safely. Reports indicated that the weather was fairly good in the South Atlantic at the time when the Latécoère, still flying, sent out its message to report all well.

There is some difficulty in reconciling the reports of faint distress signals received days later with still more recent reports of finding wreckage believed to have been from the flying boat, and said to have shown traces of fire. Several explanations are possible, and it may be that fire broke out while the boat was still airborne, that the pilot managed to alight, that the fire was got under control but that parts of the radio equipment was put out of action, thus preventing the sending of the distress signals until a later time. This, of course, is conjecture but appears to fit in with the known facts.



SCION OF THE "504": It is now nearly 35 years since the Avro 504 biplane was supplied to the Royal Flying Corps. After being used successfully as an operational type it was selected by Colonel Smith-Barry as the standard instructional aircraft of that Service, and later of the R.A.F. The Avro Athena T.1, seen above on an early test flight, embodies all the experience accumulated by Avro with 504s of various marks, and with the later Tutor and Type 626. High performance in the Athena has not been obtained at the expense of field of view and ease of maintenance.

SAMEDAN

Some Thoughts on the International Gliding Contests, 1948 : A Costly Barograph Failure : The Accidents to Nicholson and Greig

By ANN DOUGLAS
(Captain of the British Team)

Samedan airfield in the Engadine. It is 5,608ft above sea-level.

THE British Gliding Team arrived in Samedan on July 7th, twelve days before the start of the competitions, and after an extremely easy journey across England, France and Switzerland—except that it rained consistently the whole way out. The weather during the practice period was poor and included at least one full-blown snowstorm. However, due to the capacity of Wills and Nicholson for enquiry and analysis of the local conditions, the Team learned a tremendous amount in the few days at its disposal; it started the competition full of enthusiasm and hope, although with full realization of the disadvantages under which we were competing. These were: (1) We were the only nation entering which had had no experience of mountainous soaring; (2) We were one of the very few unsubsidized nations present.

On the first day of the competition the weather cheered up, and the contest was for a triangular course with awards for height. Conditions made the course easy to complete, and almost at the moment the first competitor arrived back at Samedan, an enormous cu-nim started building-up over the nearest mountain. One by one the gliders streaked back over the valley and disappeared into this vast turret of cloud. We were tremendously pleased when Philip (Wills) landed, having reached over 6,000 metres, as only one other pilot (Lambert, France) had exceeded this height. But gloom descended when it was discovered that the official Swiss barograph had failed to record at the critical moment, and that we would lose about 4,000 vital marks. There was nothing that we could do about this misfortune except to ask the barograph chap to stop apologizing.

The next three days passed steadily with G.B. (Welch) in third place, and the first week's flying ended with a day of closed-circuit racing, which completely up-ended the order. The Swiss, who had been near the bottom of the list, came romping upwards, several of the pilots at the top fell sharply to the bottom, and the British congregated in a little heap slightly below the middle of the placings, as though huddling together for protection from this class of soaring, which we had not previously met.

Sunday was a rest day, and Monday saw the start of the three-day goal-flight period, in which only the best flight made by each pilot counted. A period such as this calls for a certain amount of tactics in theory, but none in practice, as one is always so afraid someone else will achieve something startling that it is difficult to resist wearing oneself out in vain attempts on bad days. The second day of the goal-flight period was very poor, but everyone monotonously took off again and again in an effort to do *something* in case the third day was also bad.

The third day, however, produced some reasonable weather, with the southerly Maloja blowing, and an upper wind of light N.E. The two possible courses were the great Rhine-Rhône valley running from Chur to Lausanne and westwards, and over the Maloja to Italy. The British decided on the latter, and the met. was equally good for both directions. Of the pilots who went westwards, a good many exceeded 200 km. On entering Italy, the British pilots found the weather tending to big cumulus and broken low cloud, with the mountain tops in cloud, and patches of visibility somewhat below Samedan standard. Wills landed on the west bank of Lake Como, and Forbes and Mallett landed at Locarno and Bellinzona respectively. Nicholson and Greig had both declared Nice, and at Samedan we had tremendous hopes that they were well on their way, until the telephone rang about 6 p.m. telling us in excited Italian a garbled story about pilots with broken legs.

The accidents in which both Nicholson and Greig were killed have produced such a wealth of inaccurate rumour that I think it

LUNCHEON EXCITEMENT: (Left to Right) Lt. Cdr. Blake, Mrs. Nicholson, Mrs. Ann Douglas, Mrs. Pressland, Harold Kent and, pointing, Dr. Walter Dollfus.

Samedan . . . . .

would be as well to try to clear up the position a little. First, although both gliders crashed within half an hour, and within two miles of each other, the causes were fundamentally different. Greig was seen to be flying fairly low on the hillside over Era, near Lake Como. He was seen to do two left-hand circles and commence a third one nearer to the hill face; while in this circle he flew between the hill and a ⅜in log-transporter cable, which cut about 3ft off his left wing. The Olympia spun down at once and crashed nose-on into the hill face on its third turn, the pilot being killed instantly.

Nicholson climbed high in the Samedan region and then glided at a steady 1½ metres per second for about 30 minutes. Wills did the same thing at about the same time and landed at Dervio on the N.E. corner of Lake Como. Nicholson presumably flew to the N.W. of Lake Como in this long, straight, clear-air glide, and then apparently flew along the upwind face of a spine of mountain which runs out from the main massif towards Lake Como above Gera. The top of this spine, near the massif, was in cloud at the time, and cloud extended about 300 metres down the downwind face of the spine. The barograph chart, at the end of the long, straight glide, shows a gain in height of 100 metres during a period of two minutes. At some time during this vital two minutes the Gull got into cloud, very possibly wispy stuff that formed down in the valley and came up from underneath (this was happening during the subsequent inspection of the wreckage two days later in similar weather).

So far as it is possible to judge, Nicholson must have turned into the hill more than he knew, suddenly saw the crest in front of him, pulled up to avoid ramming it, and stalled on to boulders immediately over the crest, in the cloud. The Gull appears to have hit the ground quite square and flat at about the same angle as the face. Nicholson got out himself and indicated to a shepherd his exact position on a map. He died 3½ hours afterwards, quite suddenly, from internal injuries.

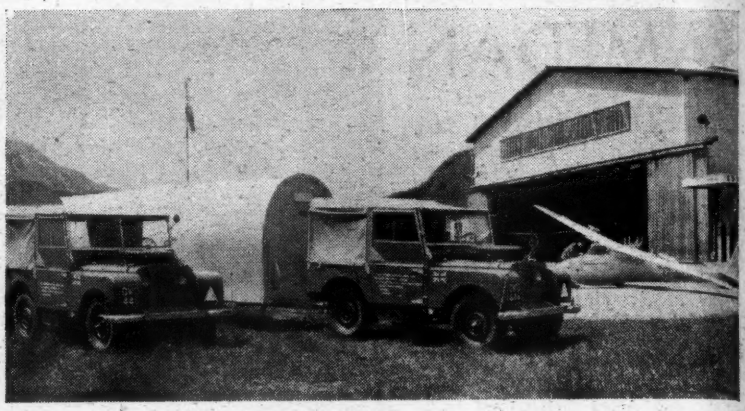
The loss of Nicholson and Greig is one which British gliding can ill afford. Kit's tremendous enthusiasm for flying and living, combined with his ability always to get the best out of anything he attempted, are qualities which cannot be spared to-day, especially when they are added to unselfishness and charm of manner.

Donald's familiar figure, too, will not be forgotten easily, neither will his kind manner and tremendous singleness of purpose. He paid great attention to detail and got to the top through sheer hard work and persistence. He was welcome in any gliding club for the assistance he so willingly gave with instructing, for his loyalty to British gliding, and lastly for his photographs.

To finish. The organization of the contests was excellent and all the staff worked cheerfully for long hours. The first official practice day was as mildly chaotic, as every-first contest practice day always is, but the teething troubles disappeared in the night and the field organization worked smoothly from then on. Perhaps the most notable aspect of the organization from the Britishers' point of view was that it was always possible to obtain an official decision on any doubtful point, literally on application.

From the point of view of an analysis of our own efforts in the contests, it is necessary to count-in Wills' 4,000 lost marks, although as regards the official results this, of course, cannot be done. With these marks counted, Gt. Britain would stand fourth. The contests were won by subsidized Sweden, with the Swiss, who know the locality backwards, in second and third places. I feel that we should not be too dissatisfied with this position. In addition, we learnt a great deal about mountain soaring and competition flying. We made many friends and we lived happily together. The Gull IV has been thoroughly proved, and I think we helped a little bit to show that Britain is still on the map.

Lastly, I would like to say how much all of us appreciated the hard work of the Gehrigers, who worked for months to make the contests a success, and we would like to thank them, as well as the other teams, for their great kindness towards us after the accidents. Nothing was too much trouble.



ON THE JOB: The Landrovers lent by the Rover Co., Ltd., at Samedan. The glider trailers weighed over two tons each and were 30ft long.

Order of Result	Pilot	Nationality	Aircraft	Total Points
1	P. A. Persson	Sweden	Weihe	27,086
2	M. Schachenmann	Switzerland	Air 100	26,258
3	A. Kuhn	Switzerland	Moswey 3	25,970
4	A. Magnusson	Sweden	Weihe	22,319
5	T. Ara	Spain	Weihe	22,169
6	H. Lambert	France	Air 100	21,111
7	R. Fonteilles	France	Nord 2000	18,458
8	H. S. Maurer	Switzerland	Moswey 3	18,034
9	A. Valette	France	Air 100	18,031
10	C. A. Wills	Gt. Britain	Gull 4	17,811
11	J. Haltiala	Finland	Meise (Olympia)	17,758
12	Juez Gomez	Spain	Kranich	16,407
13	L. Notteghem	France	Air 100	16,303
14	L. Welch	Gt. Britain	Olympia	15,664
15	R. Isler	Switzerland	WLM 1	14,239
16	R. Branciard	France	Air 100	14,178
17	R. Forbes	Gt. Britain	Weihe	14,107
18	K. Ruckstuhl	Switzerland	Moswey 3	14,083
19	Ch. Lethoré	France	Nord 2,000	12,950
20	K. Fahrlander	Switzerland	WLM 1	12,753
21	P. Mallet	Gt. Britain	Weihe	12,153
22	H. Temmes	Finland	WLM 1	10,978
23	P. Sevillano	Spain	Weihe	10,569

Notes:—

On July 20th the official barograph of Mr. C. A. Wills being defective the altitude achieved (6,000 metres was showing on his instruments) could not be evaluated.

H. Kamil, Egypt, asked to be excluded from general classification from July 26th; when his points had reached 6,124, because his sailplane was damaged on the ground.

Padova, Italy, retired from the competition for reason of *force majeure* when he had obtained a total of 1,225 points.

Kasprzyk, Poland, retired from the competition on July 21st, when he had obtained 472 points.

C. Nicholson and L. Greig were the victims of fatal accidents on July 27th. The number of points achieved by Nicholson was 13,251, and by Greig, 12,077.

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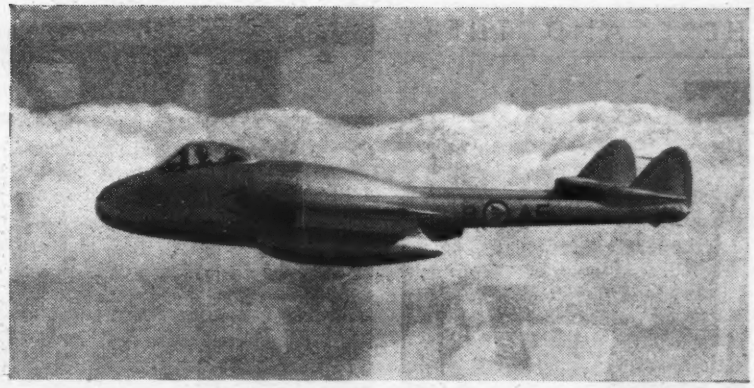
HERE AND THERE



NORWAY'S CHOICE : A contract for a substantial number of de Havilland Vampires (Goblin) has been placed by the Norwegian Government. Scandinavian newspapers state—or conjecture—that the number is 36 ; a trial order of four would thus bring the total to 40. Norway, the sixth country to standardize the Vampire, will employ the type on interception and ground attack duties. The low wing loading of the Vampire and the accessibility of the Goblin are characteristics which make a special appeal to our Norwegian friends.

Royal Visit to Glosters

DURING his visit to the Gloster Aircraft Co., Ltd., on July 28th, Prince Bernhard of the Netherlands spent about half an hour flying the Meteor 7 Trainer with S/L. "Bill" Waterton. This, the Prince's first experience of handling a jet-propelled aircraft, took place at Pershore airfield, now being used by Glosters during runway repairs at Moreton Valence. On his arrival there in a Dakota his Royal Highness was welcomed by Mr. E. S. Greenwood, technical sales manager, and Mr. R. Fitz-Gibbon Carse, sales manager of the Gloster Company. Later, the Prince flew a Hawker Fury and, after lunch at the Brockworth factory as a guest of Mr. P. G. Crabbe, director and general manager, watched the construction of Meteor airframes similar to those ordered for the Netherlands Air Force.

American Overseas Training

THE first 12 Lockheed Shooting Star fighters of the 80 being sent to the U.K. for assembly and use by the U.S. Air Force as part of its overseas training programme, reached Glasgow on August 4th. Assembly and flight testing, prior to training flights to Germany, are in progress at Renfrew airport. All the American fighters are expected to be out of Britain within six weeks. Sixteen American jet-fighters which reached Germany about two weeks ago were due to return to the U.S.A. on August 9th under the training scheme which calls for units to be accustomed to service in rotation in different countries. The personnel from the American fighter units will, during their stay in this country, be accommodated at 101 Reserve Centre, R.A.F., Bishopbriggs, Glasgow.

Transatlantic Transport

INITIATION of the first regular peacetime schedule of transatlantic training flights by the R.C.A.F.'s Air Transport Command has been announced. Canadian-built North Stars of No. 426 Transport Squadron, based at Dorval, are being used, and present plans call for two or three trips each month. The English terminal is Lyneham, Wilts. Two routes are being used alternatively on eastern and western flights: one via Goose Bay, Labrador-Keflavik (Meek's Field), Iceland-Lyneham, and the other via Gander, Newfoundland-Lagens, Azores-Lyneham. Eight days are allowed for each round trip. Four days in England are spent preparing for the return flight, and practising procedure and instrument landings at transport bases. Two crews are used on each trip.

W/C. W. G. Chapman, D.S.O., Commanding Officer of No. 426 Squadron, is a well-known R.C.A.F. pilot. During the war he commanded the No. 162 Squadron of which F/L. D. E. Hornell, V.C., was a member.

Swiss Air Rally

THE International Air Week to be held at Grenchen, Switzerland, by Farner Werke A.S.G. on August 21st until Augus 29th, as reported in *Flight*, April 22nd, will begin with a rally open to pilots of all nationalities. Classification will be based on marks awarded for the distance covered to Grenchen and on the differences between E.T.A.s and times of actual arrivals. Besides facilities for sales demonstrations of aircraft and accessories, visitors are invited to take part in an aerial tour of the Alps, calling in at Lausanne, Interlaken, Samedan, Witterswil (Basle) and other airports.

Chemical Works Explosion

AT the time of the big explosion at the I.G. Farbenindustrie in Ludwigshafen on July 28th, an aircraft belonging to S.A.S., on its way from Oslo to Marseilles, chanced to be over Mannheim, about 3½ miles from Ludwigshafen. The aircraft was flying at 7,000ft when, according to the Norwegian captain, a huge mushroom-shaped cloud of smoke arose from the town, and from the aircraft it looked as if the whole city had been thrown into the air in a sea of flames and smoke. The blast from the explosion severely buffeted the aircraft which, had it not been so high, would, the captain said, have been completely wrecked. Within 30 seconds the smoke cloud has ascended to 7,000ft. Captain Gram, in charge of the aircraft, said that a wartime raid in which he took part, during which 4,000 tons of bombs were dropped, appeared but small compared with the effect of this explosion. He later spoke with people in Heidelberg, nearly 40 miles away, and learned that even at that distance windows had been broken.

Scandia Demonstrations

A S.A.A.B. Scandia is to begin its second demonstration tour on August 16th, starting with a visit to Dublin. On August 19th it will visit

SNAKE CHARMING : The ground-crew hauling out the discharge pipe line from a Flight Refuelling Lancastrian tanker at Gatow Airport, Berlin. As reported in "Flight," August 5th, petrol is being flown to Berlin by these aircraft which carry about 1,600 gallons each and discharge it into ground tanks at a rate of 100 gallons per minute.

HERE AND THERE

Prestwick, proceeding to Gatwick on the following day. The schedule includes Jersey on August 24th, Copenhagen on the 25th, returning to Linköping on the 27th. On September 5th this aircraft will take off on its third demonstration tour, calling at Amsterdam and visiting The Hague, Brussels, Geneva, Lisbon and Madrid. The Scandia was described in a fully illustrated article in *Flight*, June 23rd.

Appeal Fails

THE House of Lords recently dismissed an appeal by Mr. F. S. Short and the Lonsdale Investment Trust against an Appeal Court decision regarding the valuation of Short Brothers' shares. The Appeal Court had ruled that the price of £1 9s 3d, based on Stock Exchange quotations, was the correct figure to be paid for shares transferred under the Defence Regulations in March, 1943.

American Factory Dispersal

FOLLOWING recommendations by the American Government, the Chance-Vought division of the United Aircraft Corporation is moving 60 million pounds worth of machinery and about 1 500 employees and their families from Stratford, Connecticut, to Dallas, Texas, a distance of nearly 1,700 miles. The move, part of a plan to disperse important industrial undertakings, is expected to result in improved flying and production facilities and reduced maintenance costs.

Radio Reunion

DURING a transatlantic flight in a T.C.A. North Star aircraft the stewardess learned from a chance remark of one of the passengers, Mr. W. Shorden, that his son, a lieutenant in the Navy, was serving aboard H.M.C.S. Weather Ship *Saint Stephen* off the Labrador coast. The stewardess passed the information to the aircraft's captain, who called up the weather ship by radio-telephone and enabled Mr. Shorden to speak to his son for the first time in two years.

THE SHAH IN THE WEST COUNTRY: For the recent visit of the Shah of Iran to Bristol a Wayfarer was flown from Filton to Northolt and returned with the Shah at the controls. When he reached Bristols he inspected the works and the Brabazon; he flew a Meteor 7 in company with S/L. W. Waterton and remarked that he found it the easiest machine to fly that he had ever handled; incidentally he has a Hurricane of his own. Later the Shah tried out the Bristol 2-litre car at high speed on the perimeter track.

News in Brief

MR. ARNOLD LATHAM, who has been succeeded as production manager for the Bristol Brabazon by Mr. F. J. Chard, as reported in *Flight*, August 5th, has taken up the appointment of general manager of Fawcett, Preston, Ltd., a subsidiary of Metal Industries, Ltd.

* * *

News from Cape Town states that the skies over the Peninsula will in future be patrolled by aerial police to stop low and dangerous flying and to check other violations of flying regulations. Not only road hogs, but air hogs, must now mend their ways.

* * *

An award of $500 has been made to Miss Jill Varney, of Brookman's Park, Herts, as the first prize in a competition run by Northwest Airlines in America to name a special fleet of Martin 2-0-2 aircraft. The aircraft will now bear the winning name of "Speed Liners" and operate on Northwest Airlines' routes from New York to Washington, and trans-continental services to the West Coast termini.

* * *

During the Olympic Games field and track competitors of all nationalities will receive a daily supply of fresh eggs through the courtesy of the Clonliffe Harriers, Dublin. The first consignment of 1,000 eggs was carried in an Aer Lingus aircraft, and the company will continue to fly an equal number of fresh eggs a day from Dublin to London until the conclusion of the Games.

* * *

The first batch of Naval flying cadets numbering 12, who were selected from 1,500 applicants, have completed their three months' disciplinary training at Flinders Naval depot and have commenced their elementary flying course with the Royal Australian Air Force. They are being trained for the aircraft carriers now being built for the R.A.N., and on completion of their flying course will attend a naval course in Scotland for two years.

* * *

Mr. Rex F. Stedman has been approved as a test pilot consultant by the Air Registration Board, in which capacity he will be able to undertake prototype, research and development test flying on a free-lance basis. Prior to this Mr. Stedman served on the permanent staff of the Chrislea Aircraft Company, and was responsible for all the prototype testing on the Chrislea Ace and the test and development flying of the Super Ace.

* * *

Permission to charter an Australian National Airways Skymaster to fly to New Zealand has been refused the "Old Vic" Company, on tour in Australia with Sir Laurence Olivier. The application was turned down by the Director General of Civil Aviation on the grounds that petrol could not be spared owing to the acute shortage of dollars, and as there is a regular service between Sydney and New Zealand. Much adverse criticism has been made of the decision.

CIVIL AVIATION NEWS

Canadian Pacific Route : U.S. Mail Subsidy Inadequate: Other Aircrew Salaries

CONTROL PRACTICE: Operators at Idlewild Airport controlling aircraft during practice circuits before it was opened on July 1st. It is understood that the airport will have 15 of the largest hangers in the world, and it is intended that eventually it will be equipped to handle 3,000 aircraft a day on six runways.

MINISTER'S TOUR

LORD PAKENHAM, Minister of Civil Aviation, left Northolt for Renfrew on August 7th, on his way to attend a meeting of the Scottish Advisory Council on Civil Aviation in Glasgow. Afterwards he was to fly to the Western Isles to inspect some of the five M.C.A. airports in the Hebrides. On Monday the Minister was to fly to Northern Ireland, where he was due to meet the chairman and members of the Northern Ireland Advisory Council on Civil Aviation, and lunch with the Rt. Hon. Sir Roland Nugent, Northern Ireland Minister of Commerce. In Dublin Lord Pakenham expected to meet members of the board of Aer Lingus.

C.P.A. PACIFIC ROUTE

AS mentioned in *Flight*, August 5th, air services are to be started across the Pacific Ocean from Canada to Asia and Australia by Canadian Pacific Air Lines, a subsidiary of the Canadian Pacific Railways. Two routes will be operated, one from Vancouver to Sydney through Honolulu, Canton Island and Fiji with a connecting service from Fiji to New Zealand; and the other route from Vancouver to Hong Kong through the Aleutian Islands, Kodiak and Shemya, Tokyo and Shanghai. The services will be operated with four Canadair Four aircraft as soon as the equipment is ready.

S.A.S. ANNIVERSARY

SCANDINAVIAN AIRLINES SYSTEM celebrates its second anniversary on August 1st. The past two years have marked a rapid development of the airline which now operates over 9,300 miles connecting Scandinavia with some 70 towns on four continents. Nine flights are made each week to New York and two to Rio de Janiero and Buenos Aires. During the two years S.A.S. has made 1,222 Atlantic crossings and carried 33,183 passengers, 433,454 kilos of freight, 804,738 kilos of baggages and 238,804 kilos of mail. The S.A.S. fleet now numbers 89 aircraft including 16 DC-6s, nine DC-4s and 50 DC-3s, four Vickers Vikings and three Sandringham Mark 6 flying boats. During 1949 the company expect to take delivery of four Boeing Stratocruisers and ten Saab Scandias.

U.S. DOMESTIC OPERATIONS

AT a meeting of the stockholders of United Air Lines, the American airline, Mr. W. A. Patterson, president of the company, reported net earnings of £77,670 for the second quarter of 1948, as compared with a net loss of £887,633 for the first quarter. Despite that, however, the overall loss for the first half of 1948 was £809,963, as compared with a loss of £800,050 for the first half of 1947. He criticized the Civil Aeronautics Board for its failure to establish permanent air mail rates for the company and grant adequate temporary rates. The charge per ton-mile of mail in 1941, he said, was 5s 6d, but despite rising operation and maintenance costs the company now received 44 per cent less than the 1941 rate and 57 per cent less than the 1939 rate. In the first six months of this year total operating expenses increased 8½ per cent, although during the same period general and administrative expenses had decreased 20 per cent and traffic, sales and advertising expenses had decreased 6½ per cent. Giving detailed figures, Mr. Patterson stated that for the first half of this year operating revenues totalled £8,661,457, compared with £7,544,822 for the corresponding period the previous year, and operating expenses were £9,450,767 as against £8,697,838 in 1947.

Operational figures published in the report showed that in the second quarter of 1948 revenue passenger miles totalled 339,011,011 as against 325,190,689 a year ago; mail ton-miles, 2,174,456 as against 2,222,955; and freight ton-miles, 5,135,599 as against 1,877,890. The company was operating a fleet of 141 aircraft, delivery of a further six DC-6 aircraft would bring the company's fleet of that type to 39. Seven Boeing Stratocruisers were also on order, and scheduled for delivery in 1949.

In further comment on the report, Mr. Patterson said that the air transport industry in the United States had exerted every possible effort towards economy in order to maintain passenger fares at the 1941 level, but that was not possible, and the industry could not be expected to accomplish something that other forms of transportation had been unable to do in the face of rising costs. In conclusion, the president criticized the Civil Aeronautics Board for failing to note and act upon the recommendations of the President's Air Policy Commission and the Congressional Aviation Policy Board, and urged that the Board should now accept and discharge its responsibilities with vigorous leadership and realistic action.

RADIO COMMUNICATIONS IN EAST AFRICA

TO cater for the rapidly expanding aviation services, both local and trunk routes, a new system of short-wave radio communications is being planned for Kenya, Uganda and Tanganyika. A total of 48 Marconi short-wave transmitters including two of the latest types of instrument are to be installed for this service. These new types of transmitter are the Marconi TGS.541, a 200-watt transmitter with a frequency range of 1.5 to 23 Mc/s, and Type TGS.501, a 100-watt set covering a frequency of 1.5 to 13 Mc/s. Both types are designed for operation on radio-telephony or telegraphy and include crystal control with provision for the rapid selection of any one of six working frequencies, a useful asset where a large volume of traffic is handled. The first of these transmitters is to be installed at Mbeya airfield, Kenya.

AIRLINE CREWS' SALARIES

THE National Joint Council for Civil Air Transport has announced a scale of fixed salaries for radio officers, engineer officers and navigating officers of the three British Corporations. The salary scales for radio officers class B are £550 p.a. minimum and £700 p.a. maximum, and for class A £725 to £850. The three classes of engineer officers are:

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C, £550 to £625; B, £650 to £725, and A, £750 to £850. A navigating officer class B now gets £625 minimum to £725 maximum, the scale for class A being from £750 to £850. In addition to these scales of pay an overseas allowance of 11s per day is payable to officers of B.O.A.C. and B.S.A.A., while a travelling allowance of 6s per day is permitted to those of B.E.A. while outside the U.K., but within the confines of Europe. North Atlantic pay is drawn by pilots on that run though final details of this have not been announced. A joint pensions scheme provides an income of £312 p.a. at the age of 50 years with *pro rata* adjustments above and below this age.

TICKET INTERCHANGE

BRITISH RAILWAYS and British European Airways Corporation have extended their scheme for the interchangeability of air and railway tickets. The arrangements already provided for the exchange of the return halves of rail or air tickets now include the outward halves of return tickets, single tickets and sections of rail circular tour tickets. Rail ticket holders using B.E.A. internal services will pay appropriate supplements, while air passengers returning by rail will be able to claim a refund where the air fare exceeds the rail fare. Railway steamship services, as well as certain independent shipping services operating between Great Britain, Northern Ireland and Eire, and the Channel Islands are included in the arrangements. A feature of the extended facilities is that British railway stations and town offices are now agents for B.E.A.'s internal services and air tickets are obtainable at a number of the principal stations.

TOURISTS IN BRITAIN

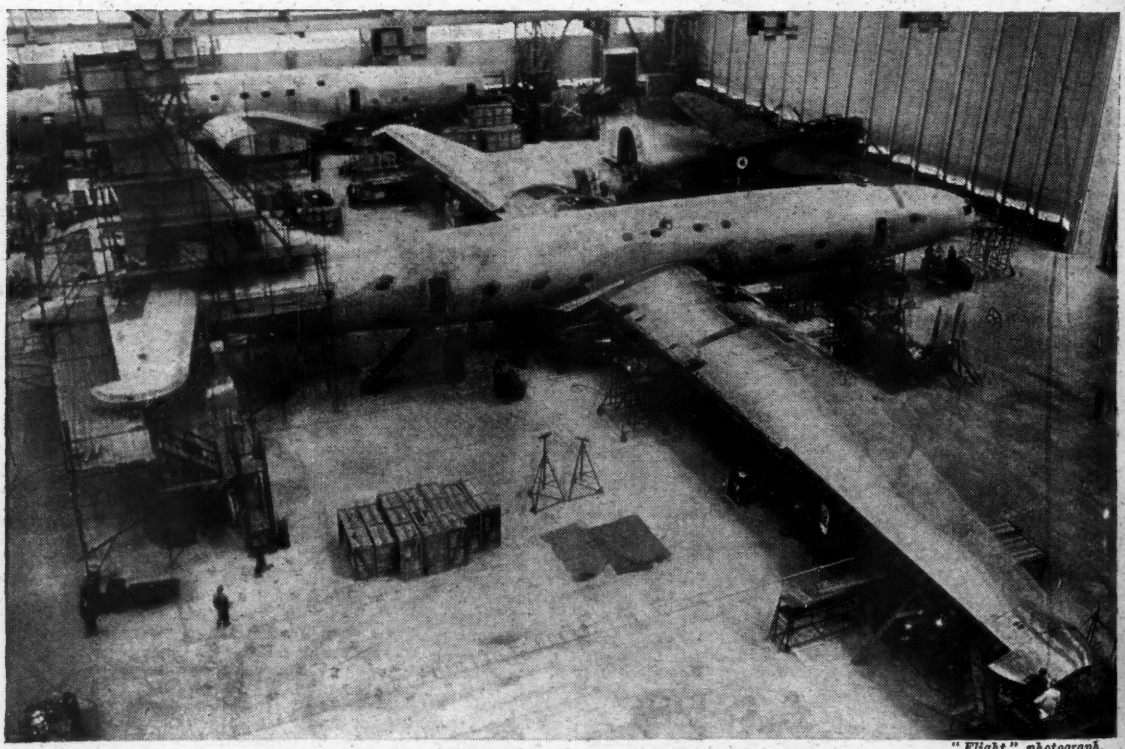
TOURIST arrivals in Britain during June reached the record figure of 43,583, 3½ per cent greater than the average for the same months over the years 1936-1938, this period including the Coronation year of 1937 with its peak tourist trade. The figure for June includes 11,500 American visitors, but not Empire tourists, for whom statistics are not yet available; and it is expected that their inclusion will increase the total by several thousands, although transport difficulties still restrict Empire movement. Indications are that the estimate of 500,000 visitors for the full year given by the Travel Association might well be exceeded, bearing in mind that June, though a popular month, is not the peak of the tourist season. The Tourist Division has also estimated that during the year 100,000 Americans will spend more than £12,000,000 in Britain and on British-owned ships and aircraft. There has been little evidence to date to suggest that the political tension in Europe is affecting tourist movement to Britain, although devaluation of the franc has resulted in a slight decline in French tourist traffic. There has, however, been a marked increase in the volume of tourist traffic from the Scandinavian countries.

HIGH COURT ACTION IN AUSTRALIA

AUSTRALIAN NATIONAL AIRWAYS last month took out a High Court writ challenging the right of the Commonwealth to operate intrastate air services in Tasmania, New South Wales, South Australia and Queensland. The A.N.A. hopes to obtain a declaration against the Commonwealth (the Australian Airlines Commission) and the Director-General of Civil Aviation that sections 19A, 46 (2), 47, and 49 of the National Air Lines Act, 1945-7 do not authorize the Commission to operate passenger or freight services within a state or between places in the states concerned. The company also asked for an injunction to restrain the defendants from interfering with the operations of A.N.A. by rendering licences inoperative under section 46 or refusing licences to the company on the ground of purported prohibitions contained in section 47. Trial of the action by a single judge is sought.

ENGINEERS' TRAINING CLASSES

ENGINEERS employed at No. 10 M.U. Hullavington approached the Chippenham Technical College authorities in September, 1947, with the suggestion that evening classes should be held for their "A" or "C" licences. Arrangements were subsequently concluded, and evening classes at a cost of 5s were introduced. Of the students who completed their training by attending these classes, sixteen appeared for the Air Registration Board's written examination, ten of whom passed, and in the further oral examinations nine were successful out of the same number of candidates. The instructor



"Flight" photograph.

LANCASTER DWARFED: A unique view of the Brabazon prototype, the size of which can be gauged by comparison with the Lancaster standing on the port bow. The four power plants, each consisting of a pair of coupled Centaurus engines, are now installed. In the background is a fuselage mock-up at present being used for experiments in interior furnishing. Details of the coupled Proteus turbo-prop engines to be used in subsequent aircraft appeared in "Flight," August 5th.

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responsible for such excellent results was Mr. M. J. Dunworth, of the Society of Licensed Aircraft Engineers. Classes will restart at the Technical College on September 13th at 9 p.m.; full details may be obtained on application to the Principal.

Q.E.A. BORROW A CONSTELLATION

ONE of the five Irish Constellations purchased by B.O.A.C. has been made available to Qantas Empire Airways in order that the Australian company will be able to increase landplane services between the United Kingdom and Australia from three to four a fortnight. The aircraft, operating on the joint Q.E.A./B.O.A.C. London-Australia service, is on loan to Q.E.A. pending the introduction by the British Corporation of the remaining four Constellations on that service, and the first flight took off from London Airport on July 30th. The Constellatoins, which will replace Hythe flying-boats, are at present at Shannon, where B.O.A.C. crews are undergoing conversion training.

BREVITIES

AT the request of the Government, major Australian airlines have arranged a reduction of certain of their schedules between capital cities to save 11,000 gallons of petrol each week.

* * *

Awards to 23 U.S.A. airlines which had no fatal accidents to passengers or crew during 1947 have been presented by the National Safety Council.

* * *

Every aircraft now entering Australia will be required to contact a quarantine office; passengers and crew must on landing produce certificates of inoculation against yellow fever and smallpox.

* * *

Scandinavian Airlines System has become the third regular airline to transfer from La Guardia Field to the New York International Airport at Idlewild, and is now operating daily flights into and from that airfield. The service links with Stockholm, Copenhagen and Oslo, via Prestwick.

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A recent Notice to Airmen states that gliding is permissible daily at Edinburgh (Turnhouse) Airport between sunrise and sunset until August 31st. Winch-launched gliders may reach a height of 1,000ft before the towing cable is released. Two white crosses will be displayed in the signals area when gliding is in progress.

* * *

Air Chief Marshal Sir Frederick Bowhill, Chief Aeronautical Adviser to the Ministry of Civil Aviation, left by B.O.A.C. Constellation on August 4th for the United States as guest of the City of New York at its golden anniversary celebrations, to mark which an air exhibition is now being held at New York International Airport at Idlewild.

* * *

Under the arrangements whereby B.E.A. appoint associate companies to operate internal services, the Lancashire Aircraft Corporation took over, on August 2nd, the Blackpool-Southport route. Brooklands Aviation have similarly started operating between Shoreham, Cowes and Southampton. Both companies are using D.H. Rapides on these services.

* * *

Recent stringent regulations issued by the Australian Civil Aviation Department have forced a number of charter companies engaged in operations between Sydney, Athens and Rome either to close down or register under a foreign flag. Of the two companies prominent in the transport of Italian and Greek migrants, New Holland Airways, it is understood, has registered in Italy under the title Italo-Australian Travel and Transport Company and is operating a fortnightly service between Rome and Sydney; and Intercontinental Air Tours has ceased operating from Sydney, but may later decide to open a new company overseas.

* * *

Canadian Pacific Airlines have purchased a fleet of Canadair Four aircraft to operate on the company's new trans-Pacific services. Operations over the North Pacific to Tokyo and Shanghai, and through the South Pacific to Australia via Hawaii, are also contemplated. The initial order is for four aircraft and spare parts, deliveries of which are scheduled to commence early in 1949.

* * *

Trans-Canada Airlines' North Star passenger aircraft are to use the airport at Lethbridge, Alberta, while construction and repair work is being carried out at Calgary airfield, which has so far been used. In addition to reconstruction work, it is expected that two 6,000-ft runways will be built, and completion of the project will require two years. A feeder service via Edmonton, Lethbridge, Medicine Hat and Regina will link Calgary with the company's main line routes.

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Before being assigned to passenger scheduled services, the Consolidated Vultee Convair 240 was flown more than 325,000 miles by American Airlines after factory test flights had already totalled many miles. In addition to familiarization and training flights a cargo-only operation was carried out between New York and Los Angeles for 100,000 miles over a period of five weeks while the Convair's capabilities and performance were closely studied.

* * *

Civil aircraft accidents in Canada during 1947 totalled 279, an increase of 101 over the previous year. Commenting on the statistics, *Canadian Aviation* said that in most cases "show-off pilots in light planes" were the culprits, and that behind most crashes there was usually a criminally careless pilot rather than a faulty aircraft. The journal concluded that Canada's aim for 1948 should be to "eliminate the unsafe pilot from the Canadian sky."

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One of the two Lockheed Constitution transport aircraft built for the U.S. Navy recently flew non-stop from Moffett Field, San Francisco, to the Navy Test Centre at Patuxent River, Maryland, in 10 hours 19 minutes. The 92-ton passenger transport, built at a cost of £6,750,000, and carrying 7,700 gallons of fuel, was the largest aircraft to make the transcontinental flight. Known as the AR-60, the Constitu-

FULLY PRESSURIZED: The Second prototype Airspeed Ambassador is completed and is seen in this photograph alongside the first Ambassador and both are undergoing engine tests. It will be remembered that this latest aircraft has a pressurized fuselage and during the past few months has undergone special pressurization tests in the hangar.

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tion, powered by 3,500 h.p. Pratt and Whitney engines, is said to have an operating range of 6,000 miles, and the U.S. Navy claim that in spite of its size it can be brought to a stop in 2,300ft and take off in 2,350ft.

* * *

Australian airline statistics for the quarter ending March show an appreciable increase over the previous year for the same period. Passenger load factor rose from 66 to 73 per cent while freight in tons increased from 2,845 tons to 6,845. Route mileage totalled 47,733, as against 34,052 the previous year.

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Spain is now included in the list of countries in which the £35 basic travel ration can be spent. Travellers must, however, comply with Spanish Exchange Control Regulations, and will only be permitted to take out of this country, or bring back, sterling notes to a value of £5. This amount is intended for expenses on board a British aircraft or ship, and for use in the U.K. on the return journey, and may not be converted to foreign currency abroad. Full details may be obtained from Spanish Consulates when application is made for a visa.

* * *

Canadian Pacific Air Lines started operating the first direct service from Vancouver to Alaska and the Yukon on August 1st. The six-hour direct service operates twice weekly from Vancouver to Whitehorse, Y.T., and Fairbanks, Alaska, using 24-seater DC-3 aircraft, and provides direct connections with air routes to the south and to Dawson City in the north. Other C.P.A.L. services to the Yukon and Alaska are also continuing to operate. From September 1st aircraft providing sleeper accommodation and with a capacity for 18 passengers will be used.

* * *

The Minister of National Insurance was recently asked in the House of Commons to state the principle governing the decision that pilots were to be regarded as falling within the category of self-employed persons. In reply, Mr. Steele, Parliamentary Secretary, said that no special provision affecting the classification of pilots for National Insurance purposes had been made by regulations. The liability to be insured as an employed person or self-employed person would depend, therefore, in any particular case on whether or not the employment was under a contract of service. All pilots, he added, were covered by the Industrial Injuries scheme.

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Air Vice-Marshal R. Williams, Director-General of Civil Aviation in Australia, announced recently that Qantas Empire Airways and his department were jointly interested in the possibilities of a service between Australia and South Africa, if both countries agreed to operate such an air service. It was reported that Qantas had suggested opening a landplane route from Perth through Cocos Island and Mauritius to Durban.

* * *

An example of the tremendous increases in air cargo throughout the United States is furnished by United Airlines, which in June, 1948, flew a total of 565,000lb of freight, express and mail to and from Detroit, compared with 173,000lb in June the previous year. The company were also responsible for flying a total of 20,000lb of wax paper from Chicago to Walla Walla, Washington—one of the largest air freight consignments to reach Walla Walla. Three individual shipments were required to move the entire consignment, and using special automatic lifts only 20 minutes was taken for unloading each aircraft.

* * *

New Zealand is hoping to expand National Airways by purchasing British aircraft, according to a statement by Mr. Frederick Jones, Minister of Civil Aviation. Sir Leonard Isitt, chairman of the New Zealand National Airways Corporation, whose forthcoming visit to Britain was announced in *Flight*, July 22nd, is to inspect various types of British aircraft while in this country. Mr. Jones went on to say that although the British Tudor aircraft had been a disappointment, the Hermes, now in production, might suit New Zealand's internal services. If suitable British aircraft were not available, however, Canadian Canadairs might be considered, but every effort would be made to avoid dollar expenditure.

FROM THE CLUBS

ON July 17th the Fair Oaks Aero Club held a dance which was a great success, being attended by over 150 people. The membership of this club now exceeds 364, of which 142 have been enrolled this year; the flying hours for May and June show an increase over the previous year's figures of 80 hours, despite indifferent weather.

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ABOLITION of landing fees for Associate members of the Cowes Aero Club and the certainty of good refreshments and a hearty welcome continue to make Cowes airport a popular rendezvous for visiting pilots, and the holiday season is proving a busy time for the instructors and staff. An informal party was recently given for 45 members of the Isle of Wight branch of the R.A.F.A. and their ladies. Under the scholarship scheme of the Isle of Wight branch of the Air League, Sgt. Hayles of the A.T.C. recently completed his first solo successfully; plans are being made to extend this scholarship scheme. The club's air display and rally is to be held on August 22nd.

SCOTTISH GLIDING CAMP: The Scottish Gliding Union recently held the first of their series of three summer camps at which gliding instruction is given, at Balado Airfield, Kinross. At the winch controls is Mr. W. Lawson with Mr. D. Henry feeding on. After the ab initio stage pupils go to Bishop Hill for soaring instruction.

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A RECENT freak storm at Cardiff on July 29th resulted in the total loss of the Cardiff Ultra-Light Aeroplane Club's Piper Cub. The door of the hangar containing the machine was blown down and a gust of wind completely overturned the aircraft damaging it beyond repair. For over a year the club had been struggling to raise enough money for the purchase of an aircraft and the Cub had just had its C of A renewed and was due to fly the next day. Most unfortunately, as it was considered safely housed, no insurance covered the machine at the time, the policy relating to it being due to come into operation the following day. With commendable determination the club has decided to start again from scratch and, undeterred by its misfortune, hope to start flying next month!

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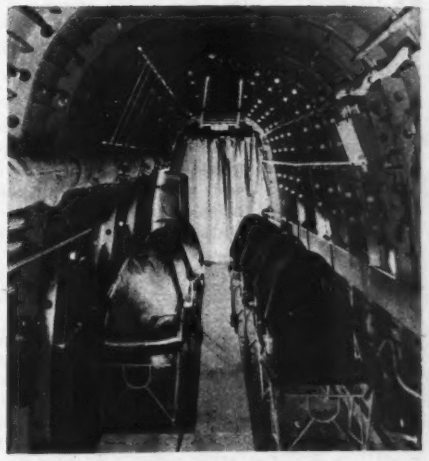
IN the competition for the "Shelmerdine" Challenge Bowl, presented to the Herts and Essex Aero Club by the late Director-General of Civil Aviation, which was flown last month, out of a field of 16 competitors Mr. John Gibson was the winner with Mr. W. J. Franklin (flying his own Gemini) second. The competition was in the form of cross-country to two appointed turning points, with a curved leg back to the aerodrome passing over an undisclosed point in the form of a white cross. The Broxbourne Breakfast Patrol took place on the morning of Sunday, July 18th, and was thoroughly enjoyed by everyone participating in 14 attacking aircraft, with 12 defending. Free breakfasts, made possible by the Club's own Pig Club, were secured by Messrs. Smith and Donaldson from Southend and by Mr. Holdup in a Cygnet from Denham, whilst Mr. Bernard Collins from Southend, although "shot down" by defenders, landed at the sealed time.

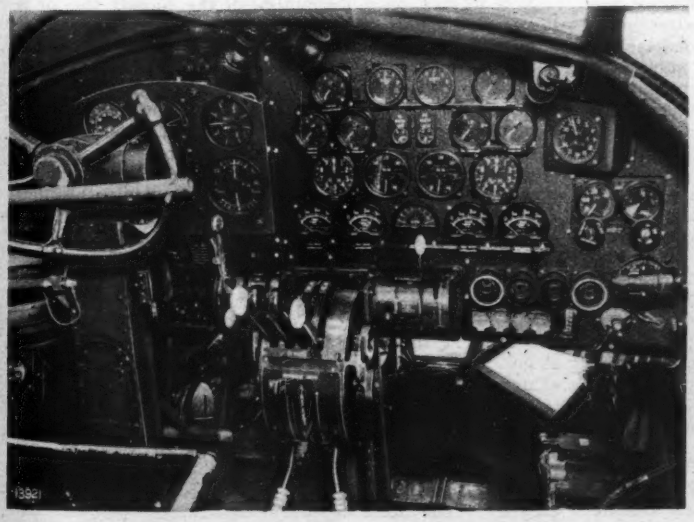
TURBINES with Transport Command

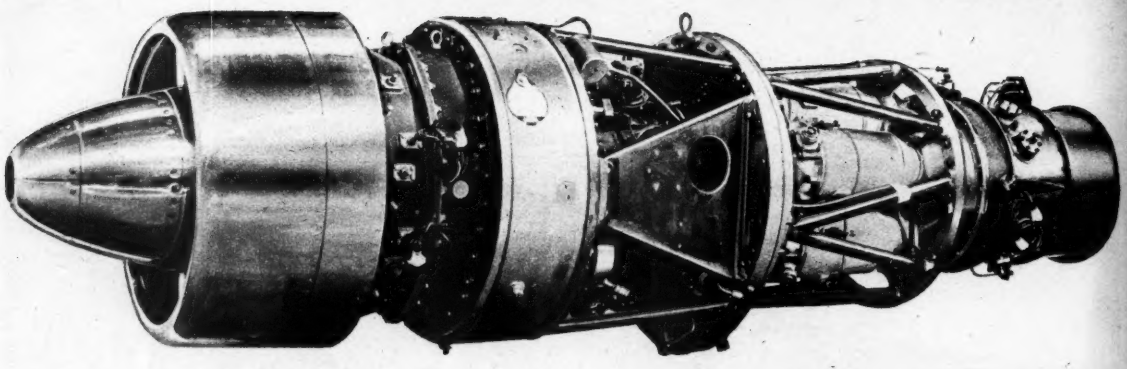
Passenger and Freight-carrying Version of the Lincoln with Bristol Theseus Turboprops

LITTLE publicity has attended the introduction into Transport Command service of two Avro Lincolns, each powered with two Bristol Theseus turboprops and two Rolls-Royce Merlin piston engines. The first of these is the subject of the accompanying photographs. Note that the tail turret has been eliminated and that the interior has been cleverly adapted for freight stowage and passenger accommodation. Though the employment of a much greater number of Theseus-Lincolns, with a view to accumulating mass experience with turboprops, could be wished for, the two machines allocated to the R.A.F. should provide the answers to many operational problems.



The general appearance of the Transport Command version of the Theseus-Lincoln is conveyed by the uppermost view (Theseus cowling removed). On the right are the passengers' quarters, lower right, freight stowage, and below, the cockpit, with the Theseus dials concentrated on one panel.





Napier Naiad

Novel Design Features Embodied in the Most Recent of British Airscrew-Turbines

ONE hundred and forty years ago a young Scotsman named David Napier set out by sailing ship from Edinburgh's port of Leith and voyaged down to London with an idea and resolution. He thought that the wooden-framed printing machines of his day could be better built with metal frames, and he founded a company with premises in Soho to prove it. In that year of 1808 David Napier was 22 years old; he died at the age of 85, having established his name enduringly in the engineering world, and we feel it is a pleasing speculation to wonder what the old gentleman would have to say about the latest product to bear that name, the Naiad airscrew-turbine.

Of the three British units of its class, the Naiad at 1,500 h.p. is the most powerful—the Rolls-Royce Dart gives 1,125 h.p. and the Armstrong-Siddeley Mamba 1,010 h.p.—and yet the overall dimensions of the Naiad are not proportionally greater. This has been made possible only by the unique structural form employed, which, in turn, has coloured the dynamic design of the engine.

From the main mounting points on the firewall at the rear of the engine, a framework of tubular bracing struts extends forward to the central mounting ring lying in the plane of the final compressor stage. By utilizing the largest possible diameter (28in) for the concentration of engine mounting loads, the point load at any one section is a minimum. From this main mounting ring, subsidiary supporting structures project forward to carry the front half of the engine, picking up for this purpose on the reduction gear casing; and also run rearward to support the rear half of the engine by attaching to the turbine inlet manifold.

This system of engine mounting renders it unnecessary for the compressor casing and the turbine shaft housing to carry bending loads, and so contributes largely to the reduction in weight of these parts of the engine. However, the adoption of this method of mounting has necessitated the introduction of articulation as between the three main elements of the rotating system. It is for this reason that the compressor is carried in a gimbal assembly at its rear end, and in a self-aligning bearing at its forward end, the torque connection being made with annular couplings.

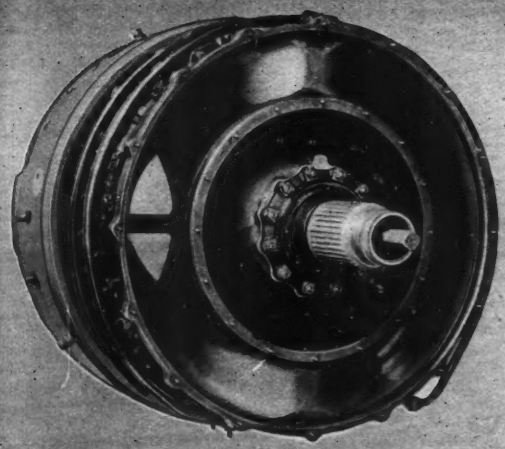
In order to attain the clearest picture of the Naiad build-up, the best way is, we consider, to progress systematically through the unit from airscrew spinner to tailcone. But before starting this survey it is felt worthwhile, for the benefit of readers who may not be overly familiar with the gas turbine principle, to dilate slightly upon the differences between turbine units designed to drive airscrews and those designed for jet propulsion.

With a jet engine, the aim is to provide the greatest mass flow possible within the physical limits imposed by size and weight parameters, and the turbine is designed to extract from the jet only just sufficient energy to power the compressor, which, of course, is the primary source of the mass flow. In airscrew turbines, or turboprops as they are now more commonly known, propulsion is vested in an airscrew and, as the sole source of the power in the engine is the turbine, it is patent that the turbine must be of such design that it extracts the maximum energy from the jet in order, first, to serve the compressor and then to feed into the airscrew what remaining power is left over. Thus the generalization can be stated that, in a jet engine, the turbine is designed to extract the minimum of energy from the gas flow, whilst in a turboprop the turbine is designed to extract the maximum of energy from the gas flow. For these reasons, single-stage turbines are more usually employed in turbojet units, whilst multi-stage turbines are more often found in turboprop designs.

Detail Analysis

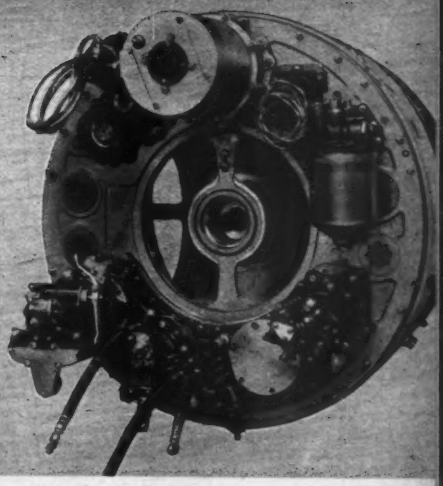
Now to start on our appraisal of the Naiad: the air is taken into the unit through the medium of a hollow spinner, a development in which Napiers have played a leading part for some considerable time (see *Flight*, October 3rd, 1946, and May 20th, 1948), and is fed to the compressor via two kidney-section ducts passing on each side of the reduction gear and integrally formed in the reduction gear casings. There are three of these casings which go to make up the reduction gear box, the internal diaphragms accommodating the various shaft bearings, whilst the outer wall of the rearmost part of the casing is fashioned with twin cavities utilized as oil tanks, the forward volume serving the governor unit, whilst the rearward cavity is, in fact, the engine sump.

The reduction gear is itself noteworthy in being of spur-type and yet providing the comparatively large step-down ratio of 14:1, this being achieved with a single intermediate stage. A central input pinion coupled to the compressor shaft meshes with a pair of large-diameter wheels, hub-splined to torsion quill-shafts which transmit the drive to layshaft pinions, each of which mesh with the main central wheel bolted direct to the airscrew shaft. In form, this reduction gear justifies the use of the term layshaft system, although, in actual fact, layshafts as such are not employed. The torsion quill-shafts, which perform the



Left : Three-quarter view of reduction gear casing showing the integral bifurcated entry to the compressor.

Right : Rear face of reduction gear showing the various engine accessories mounted around the air inlet orifices.

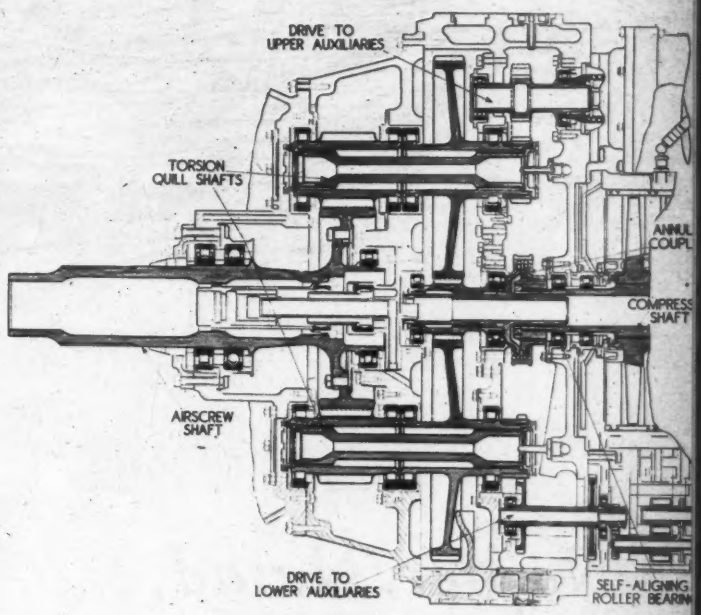


function of layshafts, have the added advantage that the torsional flexibility they provide ensures an even load distribution through the duplicated elements of the drive.

A pinion on the tail of the upper layshaft meshes with an idler which, in turn, meshes with the starter drive pinion. A second wheel on the idler shaft mates with the pinion which gives drive to the remote auxiliaries' gear box input shaft, and adjacent to the auxiliary drive pinion is a further wheel meshing with the gear driving the tachometer generator. Both the starter and the tachometer generator are carried direct off the end-wall of the gear box casing, and the drive shaft for the auxiliaries' gear box runs back the length of the engine to terminate with a universal half-coupling at the fireproof bulkhead.

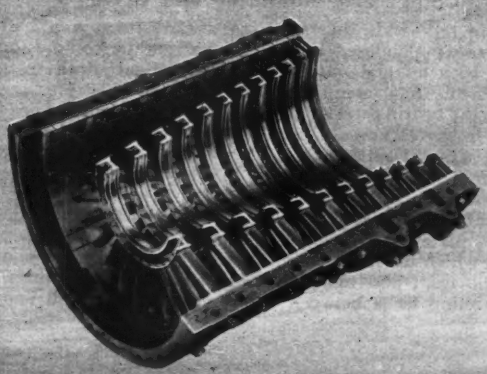
In somewhat similar fashion, a pinion on the tail of the lower layshaft drives a secondary layshaft to power a battery of pumps carried off the lower part of the reduction gear casing. Of these pumping units, the secondary layshaft is directly coupled to a two-stage scavenge pump and gives drive port and starboard to a pair of fuel pumps, further extension of the driving train being made, to starboard, to the main oil pressure pump and, to port, via an idler wheel, to the airscrew constant-speed unit.

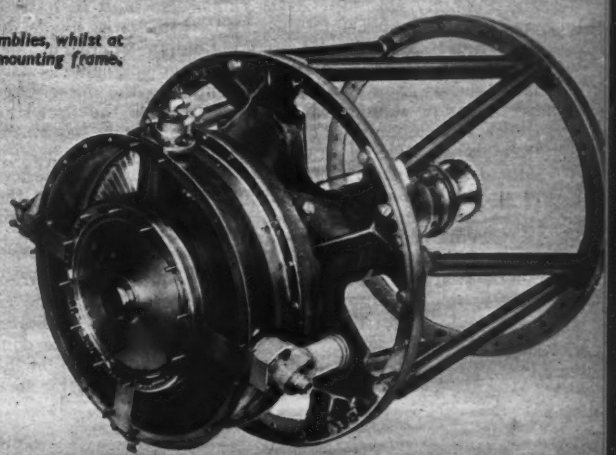
There is no rigid connection between compressor and reduction gear to impede the axial flexibility of the rotating parts and, further to this end, the front bearing assembly of the compressor shaft incorporates a specially designed self-aligning roller bearing, whilst the torque transmission is accommodated by an annular coupling, the small size of which makes surprising its ability to transmit 1,500 h.p. ; the torque loading on this coupling is, however, relatively low—440 lb/ft—as the

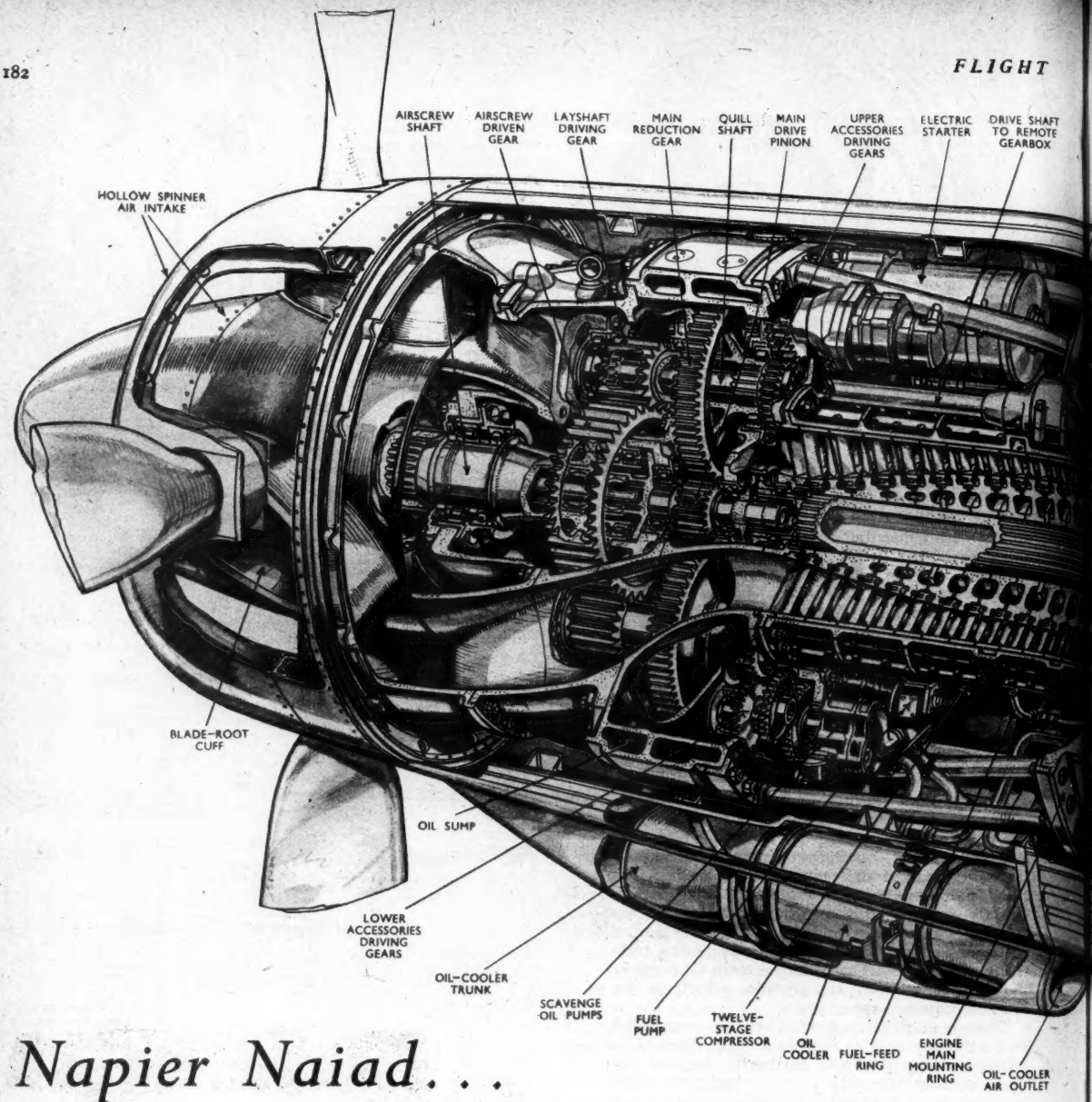


Vertical section through reduction gear showing main and secondary drive members, together with the various bearing assemblies and the forward annular coupling

At left below is one half of the compressor drum complete with its stator assemblies, whilst at right can be seen the turbine assembly together with delivery manifold and mounting frame.







Napier Naiad . . .

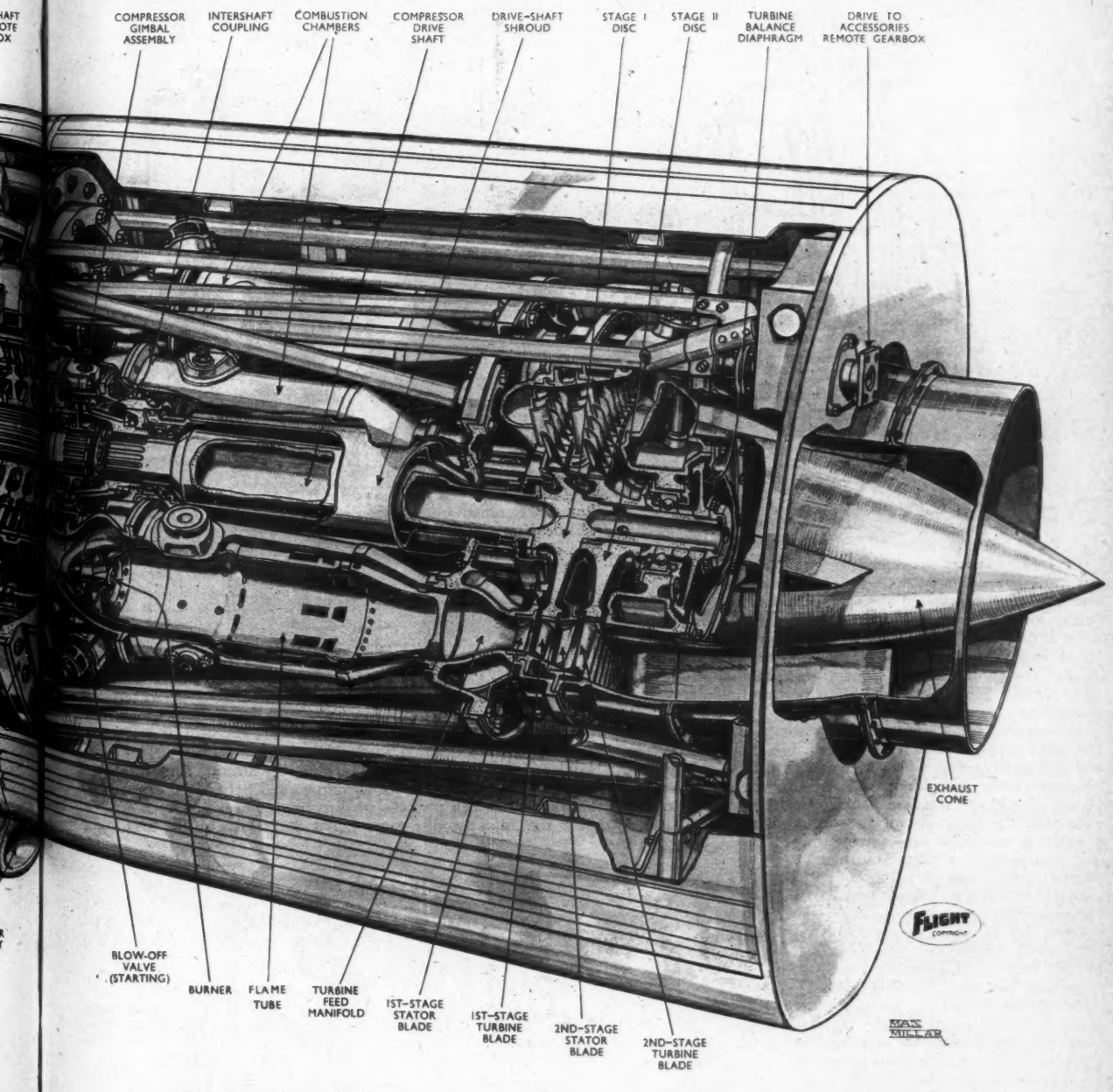
speed of rotation is so high.

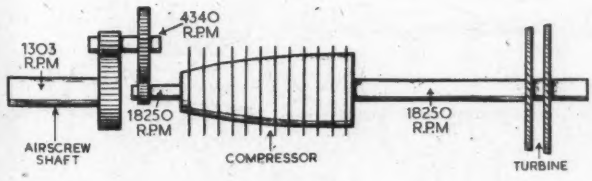
Apart from its obvious efficiency—the compression ratio is 5.5:1 and the mass airflow at peak r.p.m. is 17.2 lb/sec, an exceptional figure for a unit of so small a diameter as 10.82in—the compressor is structurally interesting. The casing is a light alloy drum, split longitudinally into halves, and the fully shrouded stator rings, also built in halves, are radially bolted into the casing with recessed, flush-faced nuts. Stator blades are of aluminium-bronze, hooked at the base to the root rings and with stud spigots integrally fashioned at their tips for attachment to the outer rings by means of shouldered nuts recessed into the enclosing rings. The employment of a bifurcated air intake has meant that an equal axial flow distribution at the compressor entry is not possible, and, in order to "de-tune" the effect of wake eddies at the confluence of the intake streams, the first stator stage of the compressor has its blades arranged at varying stagger angles and at varying angular disposition.

The twelve rotor stages also employ aluminium-bronze blades, the C_4 aerofoil section of which is the same as that employed for the stator blades, but whereas the latter have negligible radial "twist" the rotor blades twist considerably from root to tip. Rotor discs are splined on the compressor shaft in three groups of four, spaced by steel discs ground to the requisite thickness for axial adjustment and for assistance in rotor balancing. Bulb root shanks are used for attaching rotor blades to the discs, the bulb ends being peened to give locking, whilst labyrinth seals between the rotor discs and the inner stator rings preclude pressure leakage back to earlier stages. At I.C.A.N. standard the compressor gives a total head of 80.8 lb/sq in, for a temperature gradient of only a little over 200 deg C.

Compressor Mounting and Drive

At its rear end, the compressor shaft runs in a ball thrust bearing, housed in the end wall of the compressor casing with an elaborate arrangement of labyrinth seals between the final compressor stage and the low pressure area of the bearing. The gimbal assembly previously mentioned as a feature of the compressor mounting has its pivotal axes about 1¼in rearward of the thrust bearing plane and, in addition to taking the torque reaction of the compressor stator assembly, also forms the flexible bridge between the compressor end wall and what is called the main support plate of the engine. This latter is a large cast unit to which the main mounting ring is bolted in common with the front and rear subsidiary supporting structures. The meeting faces between the compressor end wall and

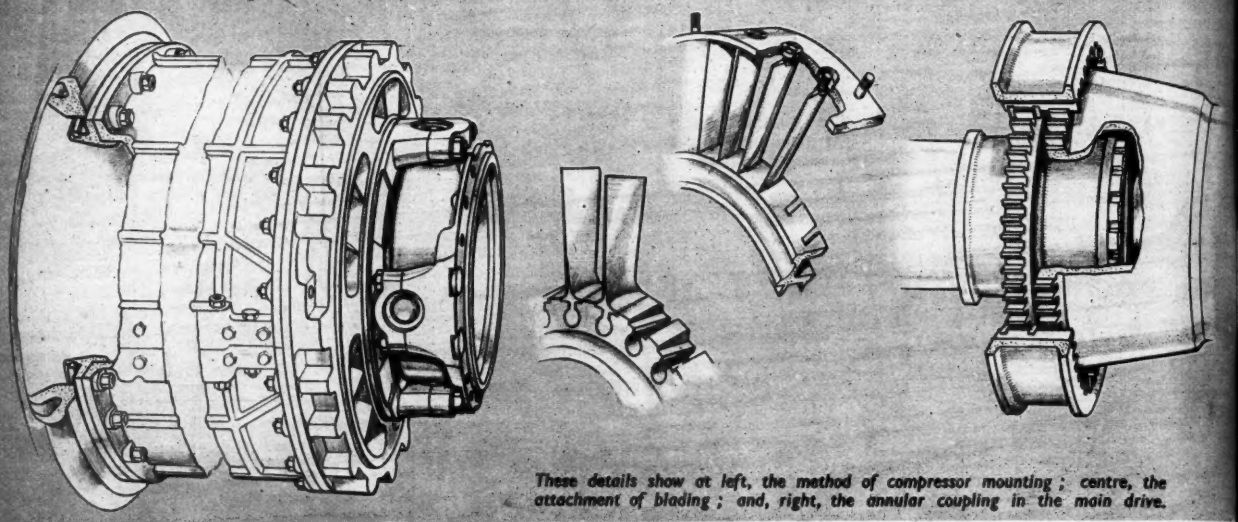




IN this fine cut-away study of the Naiad, "Flight's" chief artist Max Millar, has well illustrated the unique features of the engine and has revealed as clearly as possible the flow through the unit. At left is a simplified drive diagram giving the respective speeds of rotation.

the main support plate are double-shouldered, and U-section sealing rings of beryllium-bronze are fitted in the shoulder annulæ. As at the forward end of the compressor shaft, an essentially similar annular coupling is also used at the rear end to transmit drive from the turbine; and as the total power output from the turbine is but slightly less than 4,000 h.p., the fact that the rear coupling is considerably more robust than its forward complement is only to be expected.

The turbine shaft is housed in an enclosing shroud, bolted by means of a bell-form transfer unit to the main support plate previously mentioned, and also enclosing the journal roller bearing in which the forward end of the turbine shaft is supported. At its after end, the shaft shroud is flange-bolted to the turbine feed manifold, which, in turn, is carried by the rearward subsidiary supporting structure. Before going on to deal with the turbine proper, we should perhaps give attention to the combustion system.



These details show at left, the method of compressor mounting; centre, the attachment of blading; and, right, the annular coupling in the main drive.

Napier Naiad. . .

Five combustion chambers are employed on the Naiad, the cans being simple cylinders fabricated in Nimonic 75 and enclosing fabricated flametubes of quite conventional form, located concentrically by three radial spigots and with spring lugs at the outlet mouth for accommodating linear expansion. A novel feature of this part of the unit is that the combustion chambers are interchangeable and their fixture is such as readily to permit the removal of individual chambers if required.

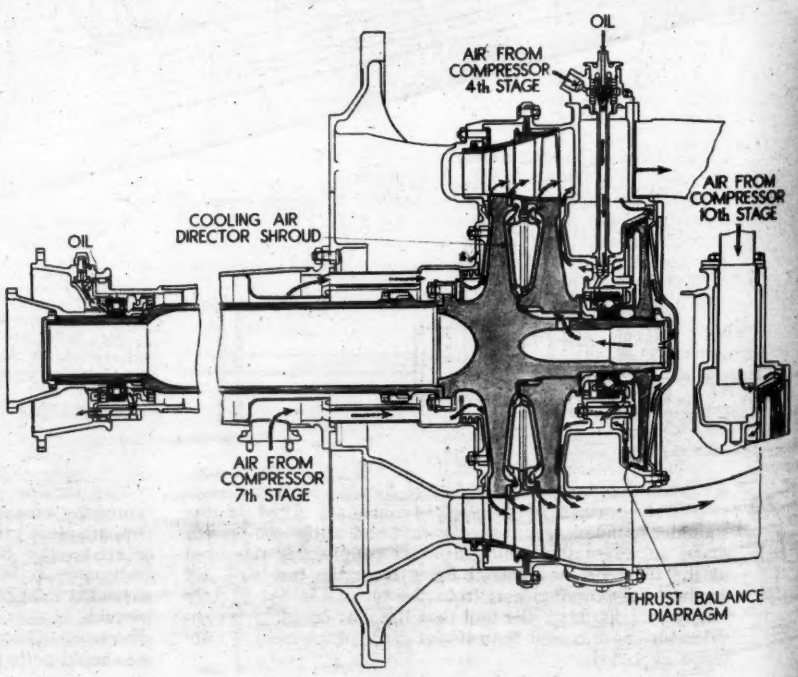
Delivery of air from the compressor is carried through the main support plate by means of five transfer passages, the exit apertures of which match with orifices in the base of each of the individual cast cup-units which form the crown of each combustion chamber. It is in these crown cups that the blow-off valves are embodied. Fuel is fed through a manifold ring surrounding the compressor at the tenth-stage station, and having pigtail branches to each of the burners. These last are of conventional downstream-discharge pattern, the nozzles being surrounded with swirl vanes to impart helical motion to the primary airflow; secondary air is admitted through holes in the flametube wall, both at the waist and at the skirt. Igniter plugs are furnished in two combustion chambers only, flame propagation to the remaining chambers being facilitated by connecting bridge tubes.

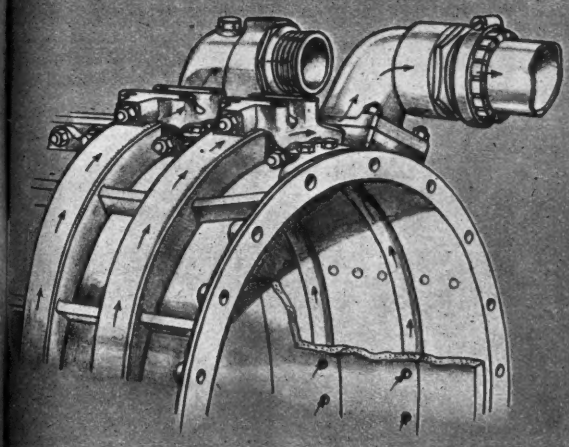
The combustion chambers discharge through passages formed in the turbine feed manifold, the passage form being such that, from the five inlet apertures, the gases are spread so as to enter the turbine nozzle ring with an equal circumferential distribution.

Design of the turbine proper is interesting. The first-stage disc is machined from Jessop's G18B steel, which has characteristics not unlike Nimonic 80, and is flange-bolted to the tail of the turbine shaft, a 3.375in diameter forging of Jessop's R20 steel; this material has a similar expansion coefficient to G18B, but is considerably easier to machine. The second-stage disc is splined to the tail shaft of the first-stage wheel and is machined from Jessop's H40 steel. Blades in each of the turbine stages are Nimonic 80 forgings secured in the discs with fir-tree roots of conventional form.

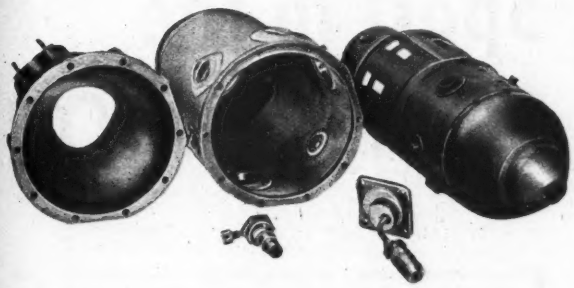
Rear support for the turbine assembly is provided by a ball thrust bearing housed in the hub of the rear turbine casing. The latter is a four-spoked assembly which is through-bolted in conjunction with the second-stage nozzle-ring to the periphery of the turbine feed manifold.

The first-stage nozzle-ring—a Firth-Vickers HR Crown Max casting—is recessed into the delivery annulus of the turbine feed manifold, being clamped into that position by the peripheral shrouding-ring surrounding the first-stage turbine blades. The second-stage nozzle-ring is of materially similar construction to the first-stage ring, but is rim-welded to the second-stage turbine tip-shroud, and also serves to carry the director shroud nested between the turbine discs for the purpose of directing the cooling airflow over the adjacent disc faces. The front face of the first-





Detail of compressor casing to show the annular ducts in the drum, and the outlet elbows to the delivery pipes for turbine cooling.



Combustion components including the intake cup, combustion chamber, and fabricated flametube, with an igniter plug and a burner nozzle.

stage disc is cooled by air tapped from the seventh compressor stage and externally piped to an annular collector chamber formed in the rear end of the turbine shaft shroud. Six axial pipes take the air from the collector chamber to a second annular chamber venting direct to the disc face.

The cooling air delivered to the inter-disc faces is tapped from the tenth compressor stage and fed through one of the spokes of the turbine rear casing into an annular chamber formed in the casing around the rear bearing housing. Part of this air is used to compensate the thrust component imposed on the turbine discs as a function of the gas flow, a piston in the form of a pressure diaphragm being carried on the tail of the turbine shaft for this purpose. A cover plate bolted over the hub of the turbine rear casing acts as a reaction face for the balance diaphragm, and the air supplied for balance purposes is vented into the core of the turbine tail shaft, from whence it is led through drillings to the inter-disc faces. The remaining air from the annular chamber in the casing is allowed to leak past the labyrinth seals around the rim of the balance diaphragm and so gain access to the rear face of the second-stage disc.

Lubrication to the turbine rear bearing is in conformity with the accepted standard of oil/air mist, the oil being fed from the metering pump to the top of the uppermost "spoke" of the turbine rear casing, at which point air is also delivered from a filter unit fed from the fourth compressor stage. All the remaining bearings in the Naiad are lubricated via internal drillings, the oil afterwards draining back to the sump formed in the base of the reduction gear casing, but, in common with the turbine rear-bearing, the turbine-shaft front-bearing and the bearings supporting the compressor shaft are all supplied with oil delivered by the main metering pump. An oil cooler is housed in a separate trunk beneath the compressor, and the cooling airflow for this is abstracted from the main intake to the compressor at the hollow spinner delivery.

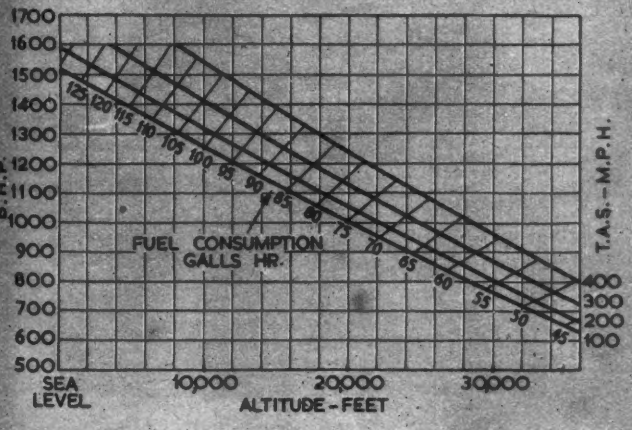
C. B. B-W.

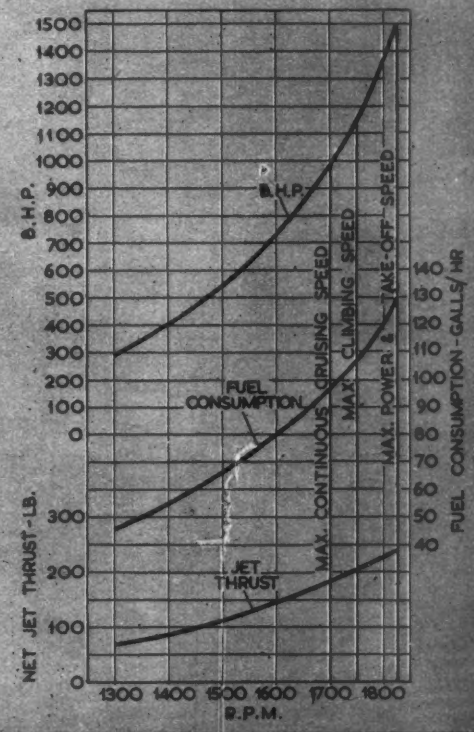
NAPIER NAIAD DATA

Max. diameter	28in
Length (airscrew cone to exhaust outlet flange)	88½in
Net dry weight	1,095lb + 2½ per cent
Oil consumption at max. r.p.m.	1 pint/hr.
Oil capacity	2½ gall.
Airscrew rotation	Right-hand tractor

Left: Vertical section through turbine assembly showing cooling-air flow-paths to the turbine disc faces, and lubrication flows at the shaft bearings.

Maximum power curves for air speeds against altitude, with fuel consumptions, and, at right, general performance curves for sea level static conditions.





Alexei Nochevny, a student at a Moscow technical sch... (left) for his 152nd drop. Below are members of t... chute section of the Central Air Club.

Sport in the SOVIET UNION

IN no other country is parachuting so assiduously practised by civilians as in the U.S.S.R. Aside from its military significance (for Russia pioneered the tactical use of parachutists) "brolly hopping" is regarded as a sport for men and women, and some very remarkable performances are on record. It will be seen from our pictures that both chest and back packs are carried.

One view on this page shows one of the old Po-2 biplanes, another the more recent UT-2 monoplane. Latest of the Russian light trainers is the Yak-18, described in *Flight* of June 24th.

Vassili Pavlov, a Soviet air celebrity and a regular participant in Aviation Day parades.

AN ULTRA-LIGHT

Slingsby Motor Tutor Developed from Glider

The Slingsby Motor Tutor is quite an eyeable little craft. Its wing loading is reminiscent of the earliest flying days.

DESIGNED to meet the requirements of the Ultra Light Aircraft Association, the prototype of the Slingsby Motor Tutor has made its first flight trials and promises to be a safe, easy-to-fly machine. Powered by an Aeronca J.A.P. flat-twin of 37 h.p., the Motor Tutor cruises at about 60 m.p.h., and as it has been stressed o come within the semi-aerobatic category, it can be looped and perform stall turns.

That the general appearance resembles that of the Slingsby Tutor glider is scarcely surprising in view of the fact that the powered machine has the majority of its components interchangeable with those of the glider. The wing has been raised a matter of eight inches, and the only modification to it is that caused by the installation of two 4½-gallon petrol tanks, each with its visible fuel-contents gauge. At 2,250 r.p.m. (cruising at 60 m.p.h.) the engine uses about 2½ gallons per hour, giving a duration of some 3½ hours and a still-air range of approximately 200 miles.

The front portion of the fuselage has, of course, been redesigned, the engine being mounted in the nose, on tubular bearers with anti-vibration mountings on the fireproof bulkhead. The cockpit has been moved aft and is now under the main plane. The cockpit layout is simple, with no superfluous gadgets, but including all the necessary instruments. The cockpit is open, but there is a Perspex windscreen.

Another change necessitated by the fitting of an engine in the nose is the introduction of an orthodox undercarriage in place of the central skid. The Dunlop 14-in wheels are fitted with brakes, and springing is by rubber cord. The tailwheel is of the usual castering type.

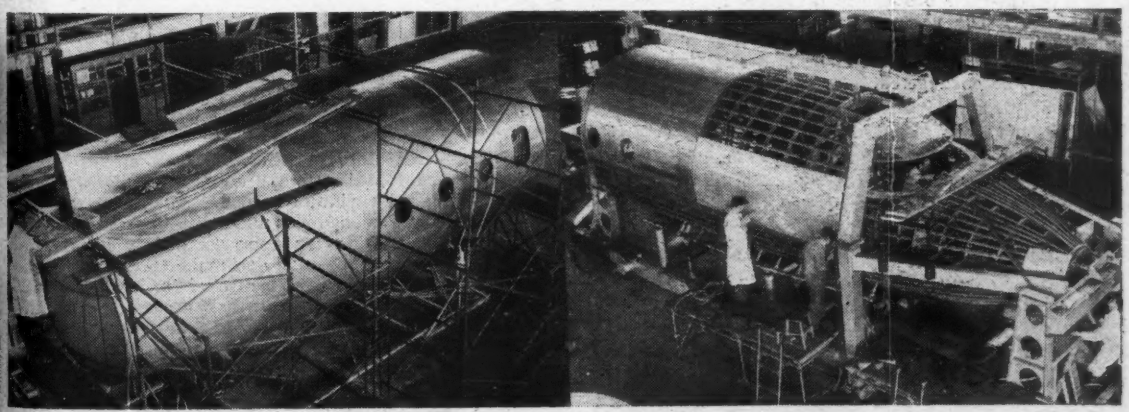
Slingsby Sailplanes, Ltd., hope to be in a position to market the Motor Tutor in kit or semi-kit form. This will not only reduce the price to the home market but will lower export costs. So far no definite decision has been taken as to the numbers to be built. Production will be governed largely by the supply of engines, which is limited at present.

SLINGSBY MOTOR TUTOR Aeronca—J.A.P. 37 h.p. Engine

Length o.a.	20ft. 10ins.
Wing span	4ft. 4ins.
Wing area	170 sq. ft.
Weight empty	557 lb.
Disposable load	233 lb.
Normal gross weight	790 lb.
Wing loading	4.56 lb./sq. ft.
Power loading	21.3 lb./h.p.
Cruising speed	60 m.p.h.
Still-air range	200 miles
Duration	3.5 hours

607 SQUADRON IN GERMANY

THE annual summer camp of No. 607 (County of Durham) Squadron, R.Aux.A.F., was this year at R.A.F. Station Lübeck, Germany. Apart from a small party which travelled by rail and sea, the entire Squadron was moved by air, the ground crews by Ansons and Wellingtons, and the pilots flying their Spitfire 14s and Harvards from Ouston to Lübeck via Manston and Eindhoven (Holland). The weather was excellent throughout. Beer at 6d a pint is reported to have proved an attractive proposition as an alternative, or supplement, to swimming, yachting, gliding and riding.



JET LINER: A short/medium range pure-jet civil transport, powered with four Rolls-Royce Derwent 5 turbojets, the A. V. Roe (Canada) C.102, the prototype of which should fly in about seven months' time, is seen under construction. In the tail section (left) the pressure bulkhead is visible. The fuselage is divided into five main components and the wing centre section, incorporating the power plant nacelles, is integral with the central portion of the fuselage

AVIATION IN BRAZIL

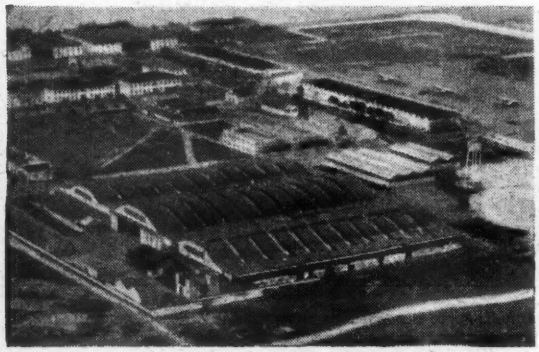
Considerable Progress Made During Post-war Years

A PLAN for a strong, integrated system of military defence for the Western Hemisphere has been the subject of many international agreements signed by the U.S.A., Canada and Central and South American countries during the past few years. In 1945 the Mexico City Conference passed the Chapultepec Act, an agreement for collective military action, ensuring the political independence and territorial integrity of the participating states and, two years later, the Inter-American Treaty of reciprocal assistance was signed at Rio de Janeiro. These treaties, which form the basis for an integrated hemispherical defence system, are also intended to provide assistance in increasing the effectiveness of the South and Central American air forces and thus, in the event of a future war, reducing the need for U.S. assistance.

Brazil is the largest recipient of this aid from the U.S.A. and, as that country will contribute greatly to the South American defence system, it is of interest to review the advance of aviation in Brazil during recent years as an instance of the effort being made to foster and encourage aeronautical progress in this area.

Although rich in manpower, Brazil is still very young industrially. With vast expanses of comparatively undeveloped territory between many of her major cities and industrial areas, and with some 4,000 miles of coastline to defend, the need for considerable numbers of commercial aircraft and a strong air force is readily apparent. Bearing these facts in mind, the Brazilian Government, in co-operation with the U.S.A., has, in recent years, successfully fostered the growth of an aircraft industry, a comparatively modern air force and numerous civil flying schools and clubs.

In 1939 German and Italian technical missions were firmly entrenched in nearly every South American country, including Brazil. They were training South American air forces in the use of their equipment and were also operating some of South America's airlines. Their presence constituted a very real threat to the Panama Canal and proved to be a considerable obstacle in preparing for the defence of this area. The necessity of removing these missions and "de-Germanizing" South America was obvious, as was the fact that without doing so, America's vital sea lanes would be endangered.



The Fabrica do Galleão factory at Rio de Janeiro.

A line of completed HL-6B trainers at the Cia Nacional de Navegaçao Aérea Factory.

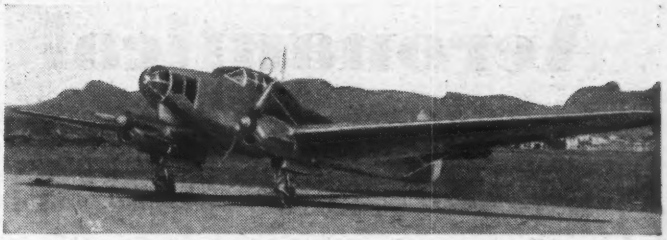
At that time, Brazil lacked most of the facilities to build modern aircraft and engines, and the nucleus of training programmes for aircrews and technicians. However, within a few years, with the aid of the U.S.A., notable strides had been made in Brazilian aviation. The school of aeronautics at Campo dos Afonsos was graduating numbers of commissioned pilots, and a number of first-class airfields and many hundreds of emergency landing areas had been constructed. In addition, new factories were building training aircraft and light aircraft engines, and the plans had been laid for a technical institute, the Escola Tecnica de Aviacao at São José dos Campos, near São Paulo. This institute, which is still under construction, will accommodate preparatory and advanced courses in aeronautical engineering, together with research and experimental laboratories. The school will be entirely under civilian management but will be financed by the Brazilian Government.

Hitherto, the practice has been to send Brazilians abroad for technical training or, alternatively, hire the services of foreign engineers, both of which methods are expensive and impracticable owing to the continual increase in the number of skilled engineers needed. All instruction will be free, but the student must undertake to serve with the Air Ministry for two years upon completing his course. The Brazilians hope eventually to make this institute the most important aeronautical centre of its kind in South America, and they have recently purchased from the U.S.A. the equipment for two wind tunnels, each of which will be powered by two 1,600 h.p. engines and have a wind speed of 250 m.p.h.

The Brazilian Aircraft Industry

An indication of the considerable strides made towards aeronautical self-sufficiency by Brazil during the war years is afforded by the Fabrica do Galleão, near Rio de Janeiro, a large and completely modern aircraft manufacturing plant

which has supplied a substantial number of Fairchild PT-19A trainers to the Brazilian Air Force. The first batch of PT-19A trainers was delivered early in 1944, and previously the factory had built two series of Focke-Wulf aircraft, forty Fw 44 two-seat primary trainers and twenty-five Fw 58 twin-engined advanced training monoplanes. Many of the latest production facilities were included in the Galleão factory, and testing laboratories were built equipped with X-ray, photographic, metallographic and spectrographic instruments. A plywood and moulded-wood shop started work on monocoque fuselages, and considerable experimentation was undertaken.



The Focke-Wulf 58 of which 25 were built by the Fabrica do Galleão.

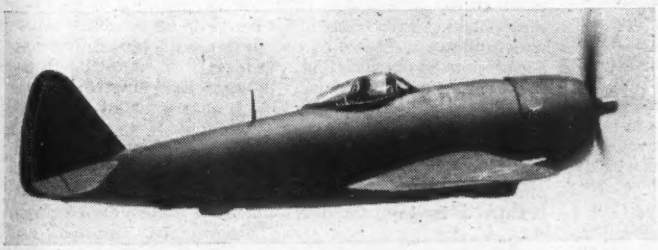
It is understood that the Beech Aircraft Corporation is now negotiating with the Brazilian Government for the lease of the factory to manufacture Beech aircraft for Brazil and other South American countries. A high percentage of native labour will be employed, and the Government will retain 40 per cent of the capital.

The Ranger engines for the PT-19A trainers were also manufactured in Brazil, by the Fabrica Nacional de Motores. This factory was recently turned into a limited liability company, the Government retaining 7 per cent of the shares and financial control. Present production includes the Wright Cyclone radial engine.

The Construcoes Aeronauticas S.A. of Lagoa Santa is another modern plant originally financed by the Government for building aircraft for the Brazilian Air Force. Little recent information regarding the activities of this plant is available, but the plant was originally built to exploit Brazilian material and labour as far as was possible.

Of privately owned aircraft companies, the two major ones are the Cia. Nacional de Navegação Aerea of Rio de Janeiro, and the Companhia Aeronautica Paulista of São Paulo, both of which companies produce light aircraft for training and club use.

The former company has produced over 100 HL-1 light two-seat cabin monoplanes powered by 65 h.p. Continental A-65 engines and developed from the popular American Piper Cub. A noticeable external change between Cub and HL-1 is the latter's use of parallel bracing struts instead of the more familiar V-type. Another product of the company is the HL-6 advanced training monoplane powered by the 125 h.p. Lycoming o-290-C engine, the first batch of fifty of which was completed some time ago. The HL-6 is basically a low-wing cantilever monoplane with fixed undercarriage, and the pilot and pupil are seated in tandem open cockpits. The second machine of the HL-6 "B-series" was modified to include a glazed sliding cockpit canopy and streamlined fairings over the undercarriage main wheels, but these "elaborations" have not been generally adopted.



A Republic Thunderbolt of the Brazilian Air Force. Insignia are carried only on the wings.

During the latter part of the war the company built a neat experimental tri-motor transport, the HL-8, approximating in size to the Avro Anson and intended to meet the requirements of the Brazilian charter and short-haul operator. The transport was a low-wing cantilever monoplane with a fixed and "trousered" undercarriage and powered by three Continental engines. Production of this aircraft was not undertaken.

The Companhia Aeronautica Paulista have produced a variety of light aircraft, including the C.A.P.1 Planalto, a two-seat advanced training monoplane powered by a 90 h.p. Franklin engine; the C.A.P.3 two-seat elementary trainer; the C.A.P.4 Paulistinha high-wing cabin monoplane alternatively powered by the 65 h.p. Franklin or Continental engines; and the C.A.P.10 four-seat high-wing touring monoplane. Considerable numbers of the Paulistinha have been built for schools and clubs and as ambulances and observation aircraft for the Brazilian Air Force. One of the Paulistinhas made a tour of the U.S.A. some months ago. The C.A.P.10 Carioca is the latest product of the company and is to be produced in both four and five-seat versions. Power is supplied by a 125 h.p. Continental C-125-1 air-cooled six-cylinder horizontally-opposed engine, which affords a maximum speed of 112 m.p.h., a cruising speed of 99 m.p.h. and a landing speed of 50 m.p.h. A tentative price of 90,000 Cruzeiros (£1,200) has been quoted.

The Brazilian Air Force

Brazil declared war on Germany and Italy on August 22nd, 1942, but prior to this the Brazilian Air Force had operated a system of anti-submarine patrols along the Brazilian coastline and had successfully attacked a number of enemy submarines. The first Brazilian fighter squadron to reach the European theatre of war arrived in Italy on October 6th, 1944, and was attached to the U.S.A.A.F. 12th Air Force. The squadron, which was equipped with Republic P-47D-27 Thunderbolts, flew numerous sorties with the U.S.A.A.F. during its subsequent period of operations.

In January, 1940, the former Brazilian Army and Naval Air Services were amalgamated to form an independent arm which was given the title Forças Aereas Brasileiras. The F.A.B. is one of the two largest and most modern air arms in South America (the other belonging to Argentina) having a total of between 750 and 1,000 aircraft, some 200 of which are with first-line squadrons.

First-line equipment now includes Republic P-47D and Curtiss P-40D fighters, North American Mitchell and Lockheed Hudson bombers, and Consolidated Catalina coastal reconnaissance flying boats.

Brazil now has a considerable network of internal and external airlines. A number of these, such as Panair do Brasil S.A., are partly owned by U.S. companies, others were founded by German concerns and were taken over by the Brazilian Government during the "de-Germanizing" process. Equipment is largely of U.S. manufacture, with a few Junkers Ju52/3M and Focke-Wulf Fw 200.

Recently the Brazilian Air Ministry authorized seven new companies to operate internal air transport services for both passengers and cargo and the number of passengers and amount of freight flown in Brazil during the past twelve months has increased out of all proportion compared with the immediate pre-war years. Panair do Brasil S.A. is expanding its services and has recently inaugurated routes to Frankfurt and Istanbul.

Aeronautical Fantasia

Some Thoughts on Dollars and Sense

By "COMPARATOR"

ONE of the more wishful foibles of the American aeronautical world at this time is the belief that only by the purchase of more American aircraft can the British airline corporations compete on a profitable basis *vis-à-vis* the Americans using the same equipment. This wishful thinking is as sincerely American as the widely held fixation that practically the whole outside world is panting to sail past the Statue of Liberty. (A recent international poll has surprised many of our American friends by showing otherwise!) But, back of this wishful thinking, one can also detect a slightly wistful note: if only the rest of the world could find the dollars to continue this one-way trade philosophy, why, everybody would be happy—especially the American aircraft industry.

Albeit, one can hardly blame the Americans for being good salesmen in thinking thus; for, talking of national foibles, what could be more characteristic of our fellow-countrymen when visiting these hospitable shores, than to declare to the world—via the American Press—how much better most things are done in the Great Republic? (The writer blushingly confesses that he has occasionally joined in this New World Symphony.) No doubt all this is good diplomacy in the best British tradition and does no real harm, so long as our peregrinating politicians are able to winnow the chaff of publicity from the wheat of fact before returning home to more austere climes. The less entertaining side, perhaps, is that it is apt to persuade our American friends that the Union Jack is now flying at half-mast and that we shall soon be cadging for more dollars to hold up the flagpole.

Surprisingly enough, this point of view (according to American news sources, at any rate) was reiterated by Sir Miles Thomas, deputy-chairman of B.O.A.C., during his recent visit to the U.S.A. (see *Flight*, June 17th). After riding in one of the Boeing Stratocruisers now undergoing C.A.A. flight tests, Sir Miles is reported as saying that his impressions of the type had been vastly confirmed; also that it had no direct competitor, so far as he knew, and that its use would have profit-making advantages over any others now available. Leaving aside the British viewpoint for the moment, this strikes one as a little biased against Lockheed and Douglas, both of whom have long-range transports for sale off the shelf, whereas the Stratocruiser is not yet certificated; and even then it will be a long time before B.O.A.C. get delivery of their half-dozen. The present estimate is late next year—which means another couple of summers without the aforesaid profit-making.

Ironing-out the Bugs

Incidentally, it is noted that Sir Miles has now tacitly confirmed one's own estimate of the delivery date by acknowledging that "the first Stratocruiser would not be delivered for another 12 or even 18 months, but the Board was not disturbed since B.O.A.C. will benefit from the experience of other operators who will fly out the bugs." (And, presumably, the profits, if any!) One can forgive the actual delay, however upsetting to past prognostications, but the naiveté of "letting" one's competitors iron-out the bugs is an astonishing credo. Sir Miles must surely know that bug chasing is really the quintessential "know-how" which forms the life-sap of any business structure. Any firm that waits 18 months expecting to cash in on its competitor's mistakes will always be left sweating a year and a half behind.

There are several puzzling angles to this Stratocruiser deal. For one thing, it is difficult to understand why the technical experts—once having crossed the Treasury Rubicon—were so keen on ordering Stratocruisers, rather than Constellations. Whatever may be the final score after the Stratocruiser is in regular operation, most technical experts are agreed that the Constellation currently stands at the top of the civil transport class. We need not lose any British face in freely admitting this—nor should we sit down to copy-cat it for 1952. The point is that having committed ourselves to buying American aircraft (instead of beefsteak and butter), we could have bought ten Connies for the price of six Stratocruisers. Moreover, one might reasonably assume we should have got them into profitable airline operation this summer, thereby getting some of the dollars back.

Wing and Power Loadings

Current reports indicate that the gross weight of the Stratocruiser may be certificated at 140,000 lb, instead of the earlier figure of 135,000 lb. If true, this would increase the wing and power loadings to 81.4 lb/sq ft and 10.0 lb/h.p., resulting in a combined wing-power loading of .814—undoubtedly an all-time high for commercial aircraft up to this time. It would have the effect of pushing up the 50ft clearance take-off to at least 2,000 yards, and the emergency full-load landing speed to around 110 m.p.h. The characteristic loadings for the Constellation are less bold, since at a gross weight of 102,000 lb the wing and power loadings are 61.8 and 10.2, giving a combined loading figure of 631. Since the Fowler flap effectiveness is much the same for both aircraft, the Constellation is likely to have the more docile handling characteristics at the low end of the speed range.

Another joker one would like to see turned face-up in Parliament is an estimate of the final bill for these six Stratocruisers when delivered late in 1949. It is generally understood that the contract is based on an escalator clause, which allows the price to rise in line with fabrication costs at the time of construction. It may be news to the British taxpayer, perhaps, that although the unit price was reported at around a million and a quarter dollars when the order was placed, it is much more likely to approach a couple of millions (i.e., 12 million dollars for the bagful) by the time these aircraft are finally delivered. Again, it appears to follow logically that this much money has been drained away from the development of British civil aircraft. And so the score will stand at America "12-up," and Britain "12-down"—a relative difference of 24 at the expense of the British worker and British know-how.

It seems to be high time that the broader national interest of a key British industry should be given priority over the balance-sheet of a nationalized airline. It is not so much a narrow question of national airline prestige, but plain national survival in a competitive manufacturing world. We may be treading on economic thin ice, but as we British see it from here, however distressing a ten-million sterling red-ink blot may look on the books of B.O.A.C., it is nevertheless an internal sterling transaction without dollar repercussions. The sterling remains in the family, so to speak.

At the risk of falling right through the ice, one would like to suggest an interesting Anglo-American parallel in the film trade; the parallel, indeed, is strikingly similar in its main aspects. Until a couple of years ago the majority of films exhibited in the U.K. were "standard-made" in Hollywood, and the British film-addict was compelled, willy-nilly, to "take it and like it." (Incidentally, one has always felt that the worm finally turned when a Hollywood Irishman reconquered Burma—with not a British uniform in sight!) An austerity-conscious Government then decided that bread and margarine must take precedence over a 17-million dollar syrup bill for the masses; also that the British people had a right to caricature themselves in their

Aeronautical Fantasia . . . . .

own damned tinker's fashion. Despite considerable squeeze-play by the film moguls of Hollywood, backed up by gloomy howls from the British film-renting trade, the result is obviously beginning to pay off the British film industry. Furthermore, if occasionally one now has to sit through a second-rate British production, one can call down the home product without fear of provoking an international incident.

Substitute B.O.A.C. for the film-renters and, say, the Avro Tudor for a typical British film production, and the analogy becomes self-evident. As a counsel of perfection, it is, perhaps, only natural that an airline operator should prefer the best-paying aircraft, but a Government-subsidized corporation may rightly be asked to back up a Government-supported aircraft industry. It must be content under reigning economic conditions with second- or even third-best, like the bulk of the people themselves. Now that the war is over we do not encourage the other constituents of the British transport system to shop around for nice new American equipment; for which reason, the railway, shipbuilding and automotive industries are showing a most healthy revival.

Canadair Compromise

The Government's compromise decision to buy Canadair DC-4Ms is now water under Westminster Bridge. We British in America view this short-range expediency with no enthusiasm whatever, for it shirks the real issue of dollars and sense. And when we say dollars, we are thinking of the U.S.A. variety and not the Canadian. On the face of it, it looks like an innocent family affair between mother and eldest daughter, each splitting the proceeds two ways. This would be an excellent arrangement, no doubt, especially as some of our finest technical skill is now emigrating to the Dominion. The joker in this pack, however, is that the DC-4M cannot disguise its birthmarks: it is still an American Douglas (and a very good aircraft at that), but presumably it is built under Douglas licence, which means that a large cut of the proceeds must find its way back, however indirectly, to the U.S.A. Worse still—and this is really the heart of the matter—the British aircraft designer and artisan are still left on the side lines as onlookers.

To the writer's way of thinking, such a compromise deal only makes the present aeronautical fantasia that much more fantastic. Sooner or later the U.K. aircraft industry has got to show the world that it can produce a top-class long-range airline transport, and if the Avro Tudor family represent our only hope for the moment, all available funds and priority in material and skilled personnel should be forthcoming in that direction. Whatever the mistakes and compromises of the past, one finds it hard to swallow the idea that such a long-established design team as Avro's cannot deliver the goods if properly encouraged. Elizabeth-Tudor, history tells us, also had a lot of trouble in her youth with the Government of the day, but she lived to lift her country out of the doldrums to write one of the best chapters in our rough island story.

Experiment in Giantism

But to return to Sir Miles Thomas and history in the making. Like strong cheese taken after bread, one leaves to the last the most entertaining remark attributed to him by our American friends, whereby he told his listeners that he held out no hope for commercial feasibility of the Brabazon I, which he termed "an experiment in giantism." One rather likes that last titbit—it reminds one somehow of J. W. Dunne's classic "Experiment with Time." Dunne, of course, was looking up and down the fourth dimensional scale of Time, whereas Sir Miles is apparently looking back wistfully on the cube-square law. During the coming 1950-60 decade, I venture to think that such a pygmy philosophy will begin to look incredibly *dèmodè*: one might as well ask Cunard-White Star to go back to paddle-boats, or expect babies to stop growing.

Knowing the liberties of the American Press, it is not unlikely that the deputy-chairman of our North Atlantic flag-carrier may have been wishfully misquoted. It is difficult to believe that a man of Sir Miles Thomas's stature would give vent to such abject defeatism. At any rate, let us do him the credit of thinking so. One can also think of many better ways of spending twelve million dollars for the benefit of British mercantile aviation.

C.A.S. AT HALTON

MARSHAL of the R.A.F. Lord Tedder, Chief of the Air Staff, echoed a warning he has sounded on many occasions in recent months, when he spoke at the A.T.C. National Rally and Sports Championships held at the R.A.F. station Halton last Saturday. If enough regular entrants of the right quality were not recruited within the next two or three years, he said, there would not be an Air Force. "Unless that happens," he said, "God help Britain and a lot of other things." Denying that it was "a question of panic" Lord Tedder gave the view that when the people of this country knew about a problem they found a solution to it. At the moment, however, they did not know.

Thirty years ago, on August 7th, 1918, A. V.-M. A. E. Borton, C.B., C.M.G., D.S.O., A.F.C., D.L., then Brig.-Gen., completed the first England-Egypt flight. This photograph shows him with Mrs Borton in the grounds of their house at Cheveney, Kent, comparing a model of the old Handley Page O/400, in which he made the first flight, with the modern Hermes.

The Air Ministry estimates that the strength of the R.A.F. will be built up from its present figure of 255,900 to 300,000 by the end of the year. These figures make an interesting comparison with strength in 1939 when the total was 175,700.

The Rally at Halton was not merely the occasion for solemn warnings. All flying was, unhappily, cancelled but the swimming and athletic events went through according to schedule. Nine A.T.C. national records were broken—two more than last year. No. 63 Reserve Group won all three swimming contests for the third year in succession. In the Junior Athletics, 62 Group triumphed, with 64 Group second; No. 61 Group was first in the Senior contests, with No. 65 Group second; and the Combined Trophy was won by 62 Group, with 61 Group second. In the morning there was a massed parade and march past, and in the evening community singing. Twenty-five Canadian cadets on a three weeks' visit to this country met Lord Tedder.

AMERICA'S TURBOPROP

A TOTAL of 104 flights have been completed by aircraft powered by TG-100A turboprops according to Mr. H. E. Granty, Project Engineer, Aircraft Gas Turbine Division, General Electric Company of America. These flights have been made to altitudes up to 40,000 feet over a wide range of powers and airspeeds and the results have been applied together with development tests, to the design of an improved turboprop unit, the TG-100B, now being manufactured by the G.E.C. Aircraft Gas Turbine Division. Some of the problems experienced with America's only important turboprop, and which, it is stated, still require considerable attention, are short periods between overhauls, short life of certain critical parts and the further evaluation of the combined control characteristics of the airscrew and gas turbine in combination.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

R.A.F. CRANWELL

Material Wanted for a Book

I AM collecting material for what I hope may be a book of experiences in the R.A.F., with particular reference to the period January, 1920, to December, 1924, at R.A.F., Cranwell. There must be still in the Service a considerable number of the early entrants to No. 2 S. of T.T. (Boys) which formed at Cranwell in 1920, and of ex-cadets from the earlier terms of the R.A.F. College.

I should be grateful for the loan of magazines, photographs, caricatures and cartoons relative to this period and for any material which might supplement my own personal recollection of five years of very enjoyable service at Cranwell.

As I am at present stationed in the United States, I shall be glad if material could be addressed to me c/o 69, Manchester Road, Swindon, Wilts., and I will undertake to return it if so requested. H. E. NOWELL,

B.J.S.M., Washington, D.C., U.S.A. Group Captain (16160).

RUNWAYS AND LOADINGS

Improved Flaps Neglected

WE may congratulate ourselves on having learned a costly lesson *if* the tragedy of the Tudor II is to result in an appreciation of the need for something better than the split or plain flap to enable aircraft to operate under international safety requirements at present-day loadings from runways of finite length.

The present deplorable deficiency of civil aircraft in meeting take-off requirements is not due to any lack of knowledge or experience in high-lift flaps. The Fairey civil transport, projected no less than ten years ago and abandoned at the outbreak of war, incorporated flaps not inferior to those now used on the Constellation. It seems incredible that this aircraft was not included in the Brabazon types.

If, as appears to be the case, other post-war types designed in the light of the I.C.A.O. requirements will ultimately share the fate of the Tudor, who were the experts responsible for issuing and accepting the design tenders, and furthermore, are we to rely on these same experts in the future?

Wooburn Green, Bucks. R. T. YOUNGMAN.

EMERGENCY CONTROLS IN AIRCRAFT

Another Theory Concerning Their Purpose

AFTER reading J. Westhead's letter in your issue of 15.7.48 concerning the rudimentary control system of the Boston, and A. S. Bolton's confirmation of their existence in your issue of 22.7.48. I would like to put forward another theory for the provision of such controls.

Although I have not seen the Boston's controls, I am sure similar equipment was provided on the Baltimore and the Avenger. If my memory is correct, the Baltimore had a wheel for elevator and aileron control, operated by the occupant of the nose position, and stowed at the side of the cockpit when not in use. The Avenger had a second control column in the radio-man's position, mid-way between the pilot's seat and the turret. In each case I was given to understand that these controls were provided to allow another member of the crew to keep the aircraft straight and level whilst the pilot was otherwise engaged. I believe that pilots of American two and three-seater aircraft were expected to act as their own navigators, and certainly some of their naval aircraft had chart-boards built in below the pilot's dashboard. When in use these chart-boards extended right across the pilot's knees, and I have no doubt that on such occasions, whilst keeping his plot up to date, the pilot was very pleased to hand over to another member of the crew.

On one occasion, shortly after their squadron had been equipped with Avengers, I heard some British Naval Observers discussing this novel item of equipment which they had discovered in their part of the aircraft. Apparently their pilots had been allowing them to take over for short periods, and one pilot, obviously having experienced some unusual evolutions at the hands of an over-zealous observer, was muttering something about "Back-seat drivers."

It would seem, therefore, that other American aircraft possessed these rudimentary controls, and that their use was primarily to help the pilot carry out his normal, if somewhat onerous, duties. Their use in emergency, as suggested by Mr. Bolton, was an additional function, probably not envisaged by the designer. N. H. PROWTING.

Wimbledon, S.W.19.

Practical Experience of those in the Boston

I WAS interested to read the letter in your issue of July 15th about Boston auxiliary controls. In actual fact they *did* work and *were* useful in emergencies.

The gunner's seat swivelled and could be locked facing for'ard or aft (as well as being adjustable for height). The control column was normally secured in clips on the side of the fuselage and when required was slid into a socket and locked in position, while pedals, placed rather far apart, worked the rudder. Throttle controls were fitted on the left (facing for'ard) and some of the early marks of Boston and Havoc (the Night Fighter version) had also an A.S.I. and an altimeter, though later marks omitted these aids to "semi-blind flying." The forward view was just about non-existent but it *was* possible to keep the aircraft on an even keel and right side up with a bit of practice.

I used the system in dead earnest once to give my pilot a break when we had been flying in small circles round an airborne lifeboat in the middle of the North Sea and he began to go cross-eyed!

A gallant gunner of the French "Lorraine" Squadron flew an aircraft back from Belgium to Manston when his pilot was hit in the head and temporarily blinded by blood on a low-level operation. The bottom gunner in this crew, who normally lay on his tummy and squirted "peas" at the countryside through the open bottom hatch, on this occasion climbed up and used the upper guns to some purpose on the odd interfering "190." The navigator gave corrections "Left" or "Right" to keep the party roughly on course, and the pilot continued to mop himself up enough to land successfully at Manston. I remember we all thought it was a very gallant effort, and I was pleased because it showed certain doubting Thomases that the auxiliary controls were not there just because of some whim of the Douglas design staff. As one could not get from one compartment to another in the Boston, I always regarded "one with stick and pedals" as a very sound plot—crude, but they worked.

PETER COLEBY, D.F.C., F/L.

R.A.F., Middleton St. George.

FIGHTER FLYING BOATS

The SR-A1 Should Become Operational

I HAVE just finished reading your excellent detailed description of the Saunders-Roe SR/A1 entitled "Fighter Flying Boat" (*Flight*, July 29th), and before coming to the real point of this letter I would like to offer my hearty congratulations on an article which was clear, concise, and, to coin a phrase if I may—"typically *Flight*."

Now to the point in question, and I quote here from one of your closing paragraphs of the article: "This country is fortunate not to need the SR/A1's operational services at the present time, but it will nevertheless profit greatly from experience gained with it."

It is true that we do not need the fully operational services of the SR/A1 at present, but these are modern times, where events happen swiftly, and to be absolutely prepared for any emergency is the only safeguard against finding ourselves in the same pitiful straits as in 1939 in the event of us being plunged suddenly into another international conflict. In view of this, then, surely it would be a wise decision to form, say, three squadrons of SR/A1s in the appropriate Command of the R.A.F., be it Coastal or Fighter. In this way, adequate operational experience would be on hand, if it was ever needed, and also a sizeable number of these aircraft would be already operational with pilots and ground crew fully equipped to operate them at once.

Surely it is not the intention of the authorities virtually to shelve this design until the actual time of need, necessitating a complete tooling and jigging of factories for production, with the resultant months of waiting before the first production models reach the squadrons. There again, there would be a further lapse of time whilst pilots and maintenance crews were

being trained in the very different operating technique needed for this type of aircraft.

However, maybe other readers more knowledgeable than I would contribute their views on the subject. I believe it calls for a little discussion and consideration. We have the immediate superiority in this class of aircraft; let us not lose it by failing to make good use of the SR/A1.

Mosborough, Nr. Sheffield. G. D. BAILEY.

JOINT AIRCRAFT OWNERSHIP

Sharing Costs and Expenses

FOR some time past I have been considering joint ownership of a light plane, as there must be many enthusiasts who, like myself, are unable to afford the expenses incurred in owning an aircraft wholly, but who would appreciate the opportunity of flying where and when they wish.

Much preliminary work has been undertaken already, and two aircraft are under consideration. They are a Ford-engined Chilton single-seat sports monoplane, and a Tipsy two-seater, both of which are available now. Of course, if there is sufficient response, both might be acquired.

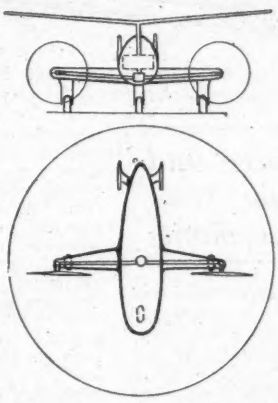
I have found a few enthusiasts, but to bring expenses within very reasonable limits I would like a minimum of ten in the case of the Chilton, or fifteen for the Tipsy, so if any "A"-licensed pilots living in the district are interested I would like to hear from them, in which case I will send further details of the scheme. DAVID F. OGILVY.

9, Imperial Road, Windsor, Berks.

THE FAIREY GYRODYNE

Is it a Helicopter?

ALTHOUGH I have every respect for the achievements of the Fairey Gyrodyne, besides greatly admiring its appearance and low-altitude performance, I am intrigued to know whether or not this machine is officially recognized as a helicopter.



The B.S.I. define a helicopter as:—"A flying machine designed for vertical ascent whose support in flight is derived from the reaction of the air on one or more normally power-driven rotors on substantially vertical axes."

Does the Gyrodyne fulfil the first phrase of this definition?

If a helicopter is permitted to have propulsive airscrews, the configuration shown in the diagram would permit a greater performance range in translational and vertical flight. One engine would supply power to rotor and airscrews, whilst a differential between the two airscrews would counteract the torque reaction. For vertical flight and hovering, the main rotor and one of the airscrews would take more power and the other airscrew proportionally less. R. G. HUGGETT.

Clifton, Bristol.

R.A.F. BENEVOLENT FUND HELPERS

Association was not Slighted

From Air Vice-Marshal Sir John W. Cordingley, K.C.B., C.B.E., R.A.F. (Retd.).

A READER complains (*Flight*, July 22nd) that the R.A.F. Benevolent Fund's scheme of appointing voluntary helpers constitutes a "slap in the face" for the R.A.F. Association.

The Fund is ever conscious of the vital importance of the fullest co-operation between the two organizations, which have as their sole purpose the care and well-being of members and ex-members of the R.A.F. and W.A.A.F., and in accordance with the Fund's policy the amount of investigatory and other work which is being carried out by the R.A.F. Association on its behalf is increasing progressively and will continue to increase. For this the Fund is at all times extremely grateful.

In addition to other functions, the voluntary helpers are intended, to quote from your news paragraph of July 8th, to "help in circumstances where normal investigatory visits by other organizations would be impracticable." This surely makes it crystal clear that no slight is intended to the R.A.F. Association, although it is most unfortunate that it was not specifically named, and this is very much regretted.

The helpers are in fact part of the Fund's well-known scheme. At the moment there are 60 voluntary county representatives and 47 voluntary helpers; of these 107, at least 75 are believed to be members of the R.A.F. Association.

Your correspondent concludes with the statement that "not one mention of the Association is made in the Benevolent Fund's Annual Report." In regard to this may I quote the following extract from Page 24 of the 28th Annual Report, covering the year 1947:—

"ACKNOWLEDGEMENTS

The Council desire to record once again an expression of their warm appreciation and grateful thanks to all those Organizations, Members of Committees, and other voluntary workers who have so unselfishly assisted the Fund in the difficult task of investigating and reporting on cases of distress, involving often long journeys in inclement weather, and at inconvenient times; also to those firms and individuals who have assisted the Fund by advice, gifts or in some other practical manner."

There follows a list of eight organizations (in alphabetical order) including the R.A.F. Association.

The R.A.F. Benevolent Fund cannot too deeply deplore pronouncements which might create ill-feeling between it and the R.A.F. Association, whose aims and objects are in certain respects so closely allied. J. W. CORDINGLEY.

London, W.1.

THE FLYING BOAT

Why Restrict its Use on the Africa Run?

DUE to various handicaps, of which our wartime needs may be quoted as a notable case in point, post-war British aircraft in the form of land-based air liners have yet to emerge from the development stage, but the same does not apply to our flying boats. In the latter Britain is supreme, and one would think that every effort would be made to expand the use of this type of air transport, a type which is suited to us both from the point of view of tradition and of geographical and strategic considerations.

It is all the more surprising, therefore, to hear the argument advanced in the House of Lords that the use of land-based aircraft on the Africa run is to be increased because of the high cost of maintaining flying-boat bases. It is difficult to believe that "politics" are not responsible for this strange prejudice against the use of flying boats. Surely the vast capital outlay involved in preparing runways far outweighs any extra cost in maintaining flying-boat bases?

Incidentally, it is difficult for the uninformed to accept that flying boat bases *are* more expensive to maintain, just as no layman will ever be persuaded it is just as safe to land in the sea, in the event of engine failure, in an aircraft designed to land on the ground, as it is to do so in one designed for this specific purpose. D. G. H.

East Twickenham, Middlesex.

FORTHCOMING EVENTS

Aug. 14th.—R.Ae.S. (Graduate and Student): Visit to National Physical Laboratory, Teddington.
Aug. 14th and 15th.—Butlin's Week-end Air Rally at Pwllheli, N. Wales.
Aug. 15th.—Wiltshire Flying Club: Thruxton air races, Thruxton airfield, Andover, Hants. (Altered from Aug. 21st.)
Aug. 15th.—Rochester Flying Club: "At Home," The Airport, Rochester, Kent.
Aug. 18th to 28th.—Model Engineer exhibition, New Royal Horticultural Hall, Westminster.
Aug. 21st.—R.Ae.S. (Brough) and Brough Flying Club: Garden party and flying display. Brough airfield, East Yorkshire.
Aug. 21st and 29th.—International Aviation Week, Grenchen airfield.
Aug. 22nd.—Cowes Aero Club: Annual air display, Cowes airport, I.O.W.
Aug. 22nd.—All Herts Model Aircraft Rally, Radlett airfield.
Aug. 22nd to 29th.—Norsk Aero Klubb: Flying Week.
Aug. 26th.—R.Ae.S. (Glasgow): Lecturettes, Grand Hotel, Glasgow.
Aug. 26th to Sept. 11th.—Machine Tool and Engineering exhibition, Olympia, London.
Aug. 27th to Sept. 5th.—Aero Club de France. "Tour de France."
Aug. 28th.—R.A.S. (Graduate and Student): Visit to Vickers-Armstrongs.
Aug. 28th and 29th.—Cinque Ports Flying Club: International flying meeting, Lympne airport.
Aug. 28th and 29th.—Aero Club de Touraine: Rally, Internationale des Grands Vins de Touraine.
Sept. 4th.—Northants Aero Club: Air display at Sywell.
Sept. 4th.—Butlin's Week-end Air Rally, Speeton, Filey, Yorks.
Sept. 4th.—Bristol and Wessex Aeroplane Club: Air display, Whitchurch airfield, Bristol.
Sept. 7th to 12th.—S.B.A.C. Exhibition and Display, Farnborough airfield, Hants.
Sept. 18th to Oct. 3rd.—Copenhagen Show, organized by the F.B.I.
Sept. 18th and 19th.—Aero Club of Milan: Air rally, Forlanini airfield, Milan.
Sept. 25th and 26th.—Butlin's Week-end Air Rally at Ingoldmells, Skegness.
Sept. 26th and 27th.—International air rally, Chateauneuf Airport, Sion, Switzerland.
Sept. 27th to Oct. 1st.—Fédération Aéronautique Internationale Conference, Paris.
Sept. 28th.—R.Ae.S. (Glasgow): Film Evening, Prestwick airport.

"*Flight*" *photograph.*

GENERAL SALUTE: *The impressive spectacle at No. 1 School of Technical Training when Air Marshal Sir Leslie Hollinghurst took the salute at the Passing-out Inspection on July 28th. A report of the inspection appeared in the previous issue of "Flight."*

Naval Aircraft in Canada

NUMBER 806 Squadron of the Naval Air Arm, whose display lately impressed hundreds of thousands of Americans at the National Air Exposition in New York, has flown to Canada from the United States to take part in the Canadian National Exhibition at Toronto (August 27th to September 11th). The Royal Canadian Navy will attach a Flight of their aircraft to the Royal Naval Squadron during the period of the exhibition. No. 806 Squadron is commanded by Lieutenant-Commander D. B. Law, D.S.C., R.N., and it includes a Sea Vampire, Sea Furies and Sea Hornets.

Rear-Admiral The Mackintosh of Mackintosh, C.B., D.S.O., D.S.C., Vice-Controller Air and Chief of Naval Air Equipment, who is temporarily in the U.S.A., has congratulated the Squadron on an "exceptionally fine and polished display" given in New York, his message adding: "You made a profound impression on 200,000 people who saw your show."

C.A.S. with R.O.C.

MARSHAL OF THE ROYAL AIR FORCE LORD TEDDER visited No. 17 (Watford) Group, Royal Observer Corps, during the Southern Area Exercise held on July 25th, and was greatly interested in the work of the Operations Room personnel. He then visited R.O.C. posts in the Group, and No. 11 (F) Group Filter Room at Stanmore. The Exercise gave many of the 3,000 Observers taking part their first opportunity to plot jet aircraft. These included Meteors and Vampires of the R.A.F., the Vickers Nene-Viking on route to Paris, and Shooting Stars of the U.S.A.F.

Royal Air Force and Naval Aviation News and Announcements

Transatlantic Vampires on Tour

GENERAL HOYT A. VANDENBERG, U.S. Chief of Air Staff, attended an impressive demonstration by the four R.A.F. Vampires at Andrews Field, Washington, on Monday, July 26th. Air Chief Marshal Sir Charles Medhurst was also present as well as most of the foreign air attachés in the capital. The flying was done by S/L. R. W. Oxspring, F/L. E. W. Wright and Pilot I. Evans in formation, and the soloist was F/L. "Jeep" Heale. A luncheon in honour of the Vampire pilots was given by General Vandenberg after he had inspected the Squadron. There was little doubt that No. 54's unique flying was appreciated by the expert audience at Andrews Field.

The same afternoon the force went down to Greenville, South Carolina, headquarters of the 9th Air Force, to give an aerobatic display on the same lines as at Washington, and also to take part in exercises originally dubbed "Exercise 200," altered to "Exercise Vampire" by the Air Force. The exercises took place on both the 27th and the following day. On the first day four of the Vampires, led by S/L. R. N. H. Courtney, acted as defenders of the Greenville base, with the object of protecting it from attack by Mustangs. The Mustangs operated from Turner Field, Albany, Georgia, and were intercepted two miles south-west of the base, which they had intended to strafe. Camera gun shots from the Vampires were subsequently analysed.

On the following day the Vampires were the "enemy" wing. Their objective was pneumatic targets 150 miles from Greenville base. Pneumatic targets are inflated rubber replicas of tanks, etc., and were situated at a range near Saint Paul, South Carolina. Protecting the objective were Thunderjets. The Vampires got through to their objective and made three diving attacks. On the way back they encountered the Thunderjets and a satisfactory scrap resulted. The exercise proved the ability of the joint Operational Control Centre at Greenville to handle British jets.

The display given on the previous day attracted visitors from considerable distances and some 12,000 people watched the Vampires put on a spectacular show. A wartime American pilot, now a journalist, describing the display in the *Greenville News*, a daily newspaper, said: "The pilots of these four planes gave Greenville the most remarkable precision flying seen in aviation here. . . . It was these loops and slow rolls in formation that attracted cries and gasps."

R.A.F.A. Celebration

ON Sunday, September 12th, the Royal Air Forces Association will celebrate the victory of the Battle of Britain by a Festival to be held in the Royal Albert Hall. This will be a unique production incorporating stage and screen. The story depicts thirty years of the history of the Royal Air Force together with the formation and advancement of the Royal Air Forces Association. A "live" sequence dealing with the formation of the

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R.A.F.A. will be followed by silent film sequences (1914-21) and other sequences illustrative of recent times.

Appointment

THE Air Ministry announces the appointment of A. Cdre. Dermot Alexander Boyle, C.B., C.B.E., A.F.C., as Director-General of Personnel (1), Air Ministry, with effect from July 29th, 1948, with the acting rank of A.V-M., in place of A.V-M. J. W. Baker, C.B., M.C., D.F.C., who, as already announced, has become A.O.C.-in-C., Coastal Command, with the acting rank of Air Marshal.

Assistant Commandant of the R.A.F. Staff College, Bracknell, Berks, since January, 1947, A.V-M. Boyle took the 1946 course at the Imperial Defence College and was formerly A.O.C. No. 11 Group, Fighter Command, to which he went in July, 1945, after having commanded No. 85 Group, 2nd Tactical Air Force, for three months. He was previously Senior Air Staff Officer, No. 83 Group, for two years. From 1942-43 he commanded R.A.F. Station, Stradishall, and in 1941 was Assistant Secretary to the Committee of Imperial Defence. In the early days of the war he was on Air Staff duties at the Advanced Air Striking Force in France.

A.V-M. Boyle was born at Durrow, Abbeyleix, Queen's Co., Ireland, in October, 1904, and was educated at St. Columba's College, Co. Dublin, and the Royal Air Force College, Cranwell, from which he was commissioned in 1924.

Summer Camps

BETWEEN now and the end of the autumn, some 35 units of the Royal Auxiliary Air Force will be going to annual camp. R.A.F. and W.A.A.F. Volunteer Reserve flying personnel will be undertaking annual training individually at up to 20 Reserve Flying Schools, and A.T.C. cadets throughout the country will be in camp at some 47 R.A.F. and R.N. air stations.

So far twelve R.Aux.A.F. flying squadrons have already attended camps, and eight more flying squadrons will be in camp during this month. Ten Regiment Squadrons of the R.Aux.A.F. will be at the R.A.F. A.A. Gunnery School, Watchet, during various dates from now onwards. Air Defence Units of the R.Aux.A.F. go to camp at R.A.F. Station, Coltishall, between August 14th and 28th and September 11th and 25th, and University Air Squadrons of the R.A.F.V.R. will be in camp at Shoreham, Sussex, between now and the end of September.

NETHERLANDS INVESTITURE: Prince Bernhard lately held an investiture at the Netherlands Embassy to bestow insignia of wartime awards on more than 50 British recipients. He is seen with Marshal of the R.A.F. Viscount Portal of Hungerford, His Exellency the Dutch Ambassador and A. Cdre. Sir Harry Broadhurst.

Medical and Dental Branches

DOCTORS and dentists released from the R.A.F. may now apply for permanent commissions in the Medical and Dental branches of the Service. Those already holding short-service commissions are being considered for permanencies. Released officers should apply to Air Ministry (M.A.1), Audry House, Kingsway, London, W.C.2.

Obituary

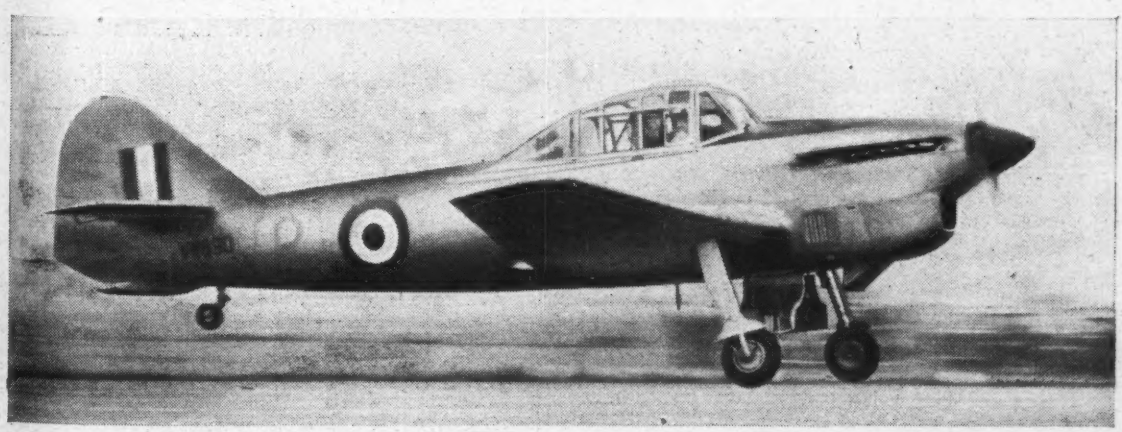
AIR VICE-MARSHAL S. J. GOBLE, C.B.E., D.S.O., D.S.C., formerly Deputy Director of Operations at the Air Ministry and Chief of Air Staff, Royal Australian Air Force, died at Melbourne on July 25th. He was born at Craydon, Victoria, Australia, on August 21st, 1891.

In Memoriam

THE memorial being raised at Northolt to the 546 Polish fighter pilots who were killed while serving with the R.A.F. is expected to be ready for unveiling during the Battle of Britain week next month.

R.Aux.A.F. Jets

THE first two squadrons of the Royal Auxiliary Air Force to be rearmed with jet fighters are Nos. 500 (County



MERLIN-ATHENA: In its Mark 2 form, the Avro Athena advanced trainer is powered with a Rolls-Royce Merlin 35 engine delivering 1,280 h.p. for take-off to a de Havilland constant-speed airscrew. At 10,000 ft a maximum speed of 289 m.p.h. is obtainable, and the sea-level rate of climb is nearly 2,000 ft/min.

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of Kent) and 605 (County of Warwick). Further squadrons of the R.Aux.A.F. will be similarly rearmed within the next few months. No. 500 Squadron, which is based at West Malling, is receiving Gloster Meteors, and No. 605, at Honiley, de Havilland Vampires. As previously reported in *Flight*, the first Vampire was delivered whilst 605 was at Tangmere.

Formed as a Special Reserve Unit in 1931, No. 500 Squadron is commanded by S/L. P. Green, O.B.E., A.F.C. During the war, it was engaged on reconnaissance and convoy escort work, first around Britain and later in the Mediterranean. Towards the end of the war, it became a bomber squadron with the Desert Air Force. No. 605, which was formed in 1926, is commanded by S/L. J. E. J. Sing, D.F.C. Before the war it won the Esher Trophy (an annual inter-Auxiliary efficiency test) six times. During the war it destroyed 167 enemy aircraft.

Both squadrons have vacancies for ground staff.

Operation Sunray

SIX Avro Lincoln bombers of No. 83 Squadron, R.A.F., left Hemswell, Lincs., on July 29th for the Middle East on "Operation Sunray," a Bomber Command training exercise. Their destination was Shallufa in the Canal Zone of Egypt, where they will carry out bombing and air firing practice. Five Handley Page Halifaxes of R.A.F. Transport Command, carrying two officers and 55 airmen, who will service the bombers while they are overseas, left Hemswell on the previous day. The aircraft will return to the U.K. at the end of this month.

Record Photographic Survey

TAKING advantage of good weather, Royal Canadian Air Force photographic survey aircraft have broken all records for aerial photographic coverage of Canada since operations were begun in 1921. The addition of Canadian-built Lancasters, enabling greater coverage, has also made a big difference to the undertaking. So far the two squadrons engaged in the survey, which is under the control of No. 22 Photo Wing, have covered over 456,000 square miles. The previous best was the 1947 season, when a total of slightly over 400,000 square miles was covered; in the first year of operations the figure was 281 square miles. Because of the uncertainty of weather conditions, which are apt to be extremely capricious in the Far North, officers in charge of the operations are cautious about making predictions of total coverage by the end of the season —now more than half over—but expect that over 500,000 square miles will have been done by then and that 600,000 is a possibility.

The results of this year's operations are expected to produce many corrections to maps of the Arctic island region as aircrew flying over the area have noted discrepancies between coastlines and existing maps that have, in many cases, been based upon doubtful information.

Reunion

NOS. 681 and 684 Squadrons, R.A.F., will hold a reunion dance at 7.30 p.m., on Saturday, September 11th, at Victoria Halls, Bloomsbury Square, London. Tickets cost 7s 6d each and may be had from J. Unsted, 112, Clifden Court, Twickenham, Middlesex.

VAMPIRES AT MITCHELL FIELD: The six de Havilland Vampire 3 fighters of No. 54 Squadron were welcomed at Mitchell Field by Colonel Thomas C. Musgrave Jr., Commanding Officer of that important U.S.A.F. base. The colonel is seen greeting F/L. Wright, one of the Vampire pilots.

Permanent Commissions

THE following officers have been selected for permanent commissions in the R.A.F. in the branches shown:—

Technical Branch

S/L.s F. J. Fenner, A. R. Gilding, C. J. Gittins, A. W. Hogan, R. J. Marks. F/L.s J. R. C. Austen, F. V. G. Bacon, E. W. Bilbo, M. V. Black, H. A. Britcher, G. D. L. Clements, J. C. Crossby, R. Douglas, A. H. G. Grant, R. H. Grant-Davie, J. F. Hawthorne, F. McL. Holmes, N. Kirby, J. B. Jones, A. C. Sanderson, C. F. S. Scott, V. V. Vockins, J. R. Vosper. F/O.s R. Ford, W. C. J. Galpin, H. R. Thorpe, C. L. B. Spencer.

Secretarial Branch

S/L.s C. Midwinter, A.F.M., B. Morgan, J. A. Sykes, D. V. H. Thomas, O.B.E., J. C. Wheeler, A.F.C. F/L.s J. A. Henshaw, J. S. F. Hutchison, G. J. Kemp, B. J. Owen, K. D. Owen, A. H. D. Pond, A.F.C., E. J. Poole, O. H. Speake, F. L. Threlfall, A. J. Turner. F/O. B. T. Sambrook. P/O.s H. Duncan, H. L. Nuttall.

Dental Branch

S/L. G. C. Baird, L.D.S., R.C.S.Eng.

Equipment Branch

S/L.s E. Banister, A. J. Bannister, K. W. Lawrence, R. Tweedy, W. E. Tyrie. F/L.s S. H. Adams, G. S. E. Clark, R. C. Fenny, L. G. Phillips, J. A. Reddington, P. C. A. Rich, C. H. Tamsett, K. Taylor, D.F.C. F/O. A. D. Harvey, M.B.E.

Short Service Commissions

THE following officers have been appointed to short service commissions in the branches of the Royal Air Force shown:

General Duties Branch

F/L.s W. G. Abel; H. E. Breeze; H. Broadmeadow; H. Currie; A. G. Douglass; E. G. G. Harrison; E. M. Higson; C. R. Johnson; B. Kilvington; C. Lydon; W. J. Marriott; J. H. Pearce; J. Rees; J. Stonier, A.F.C.; L. A. Titmuss, D.F.C.

F/O.s J. F. H. Bayliss; T. H. J. Bentley; F. T. Cooper; D. R. Corley; I. P. W. Hawkins; J. Hulbert, D.F.M.; J. W. J. Ingram; W. J. V. Surrage; G. R. Walker; G. P. Young.

Technical Branch

F/L.s G. J. Aylett; H. R. Beckett; W. S. Black; G. A. Bristow; F. W. Young.

F/O. D. G. Evans.

Equipment Branch

F/L.s J. Blair, D.F.M.; M. C. Burton; E. E. Cooper; D. D. Dunford; B. C. Emsley; W. H. Holmes; G. A. Long; A. J. Moore; C. Weekes.

F/O.s J. Batten; R. F. Beale; D. Botwright; H. Colclough; S. Crawford; T. H. Davies; J. M. Forbes; V. Grey-Wilson; J. Hoyle; A. F. Hughes; J. G. Kyles; J. Lawrence; R. P. Macintyre; D. J. Mead; T. J. Paul; W. H. Prowse; J. C. Read; J. Smith; W. A. Walsh; C. F. Weeks; R. P. Wilson.

P/O.s A. G. Creasey; R. G. Knight; D. A. Ward; K. R. Willy.

Secretarial Branch

F/L.s E. C. Bale; A. W. J. Butler; H. K. Carrol; J. H. Jones; P. T. H. Maggs; A. E. Murdock; D. G. Rodgers; P. C. Warren.

F/O.s R. H. Alison; G. E. Atkinson; T. J. Bishop, D.F.C.; W. J. Brabazon; L. W. Denning; D. Gilbert; G. R. Goodere; A. Hastie; P. R. Hawkins; E. M. Jackson; W. McDonald, D.F.C.; J. F. Munnock, D.F.C.; A. Palmer; S. P. R. Sercombe.

P/O.s A. J. M. Farquharson, H. Fox.

Medical Branch

S/L. L. G. Moore, M.B., B.Ch.

F/L. W. A. Crawford, M.B., Ch.B.

Dental Branch

F/L.s J. A. Gow, L.D.S., R.C.S.; H. M. Phillips, L.D.S.

Chaplains Branch

C. of E. Rev. T. R. Parsons; J. G. Sandford.

Methodist Rev. D. M. Rowlands.

R.A.F. Regiment

F/L. B. D. Coles.

F/O. K. D. Bailey.

P.O.s P. Abbott, R. Strong.

Catering Branch

F/L.s T. W. Baker; C. L. Fox; W. H. Quarterman.